

DESIGN-BUILD PRACTICE REPORT

SEPTEMBER 2002

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

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DESIGN-BUILD PRACTICE REPORT

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FOR

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

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Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
AC/BC	Atlantic City/Brigantine Connector
ACTA	Alameda Corridor Transportation Authority
ADOT	Arizona Department of Transportation
AGC	Associated General Contractors
BAFO	Best and Final Offer
BART	Bay Area Rapid Transit
CARAT	Congestion Avoidance and Relief for Automobiles and Trucks
CAS	Compliance Auditing Services
CEM	Construction Engineering Manager
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFLHD	Central Federal Lands Highway Division (FHWA)
C.F.R.	Code of Federal Regulations
CQC	Construction Quality Control
CDOT	Colorado Department of Transportation
CPM	Critical Path Method
DB	Design Build
DBE	Disadvantaged Business Enterprise
DBOM	Design Build Operate Maintain
DMS	Document Management System (FHWA)
DOD	Department of Defense
DOT	Department of Transportation
DRB	Dispute Review Board
EA	Environmental Assessment
EEO	Equal Employment Opportunity
FDOT	Florida Department of Transportation
FACD	Functional Analysis Concept Development
FAK	Fluor-Daniel, Ames Construction, Ed Kraemer and Sons (UDOT Legacy Parkway)
FAR	Federal Acquisition Regulation
F/E-TCA	Foothill/Eastern Transportation Corridor Agency (Orange County CA)
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTC-S	Foothill Transportation Corridor -- South (Orange County CA)
HBLRT	Hudson-Bergen Light Rail Transit, NJ
IQF	Independent Quality Firm
IMAX	Interstate Metropolitan Area Express, OR
IRCA	International Register of Certified Auditors
ISO	International Standards Organisation
ITS	Intelligent Transportation System
LD	Liquidated Damages

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LRT	Light Rail Transit
MILCON	Military Construction
MOTA	Maintenance of Traffic and Access
MTA	Metropolitan Transportation Authority
NAVFAC	Naval Facilities Engineering Command
NEPA	National Environmental Policy Act
NJDOT	New Jersey Department of Transportation
NPS	National Park Service
NTP	Notice to Proceed
NYSDOT	New York State Department of Transportation
OCIP	Owner Controlled Insurance Program
ODOT	Ohio Department of Transportation
OGC	Office of General Counsel
QA/QC	Quality Assurance/Quality Control
QBS	Qualifications-Based Selection
QMS	Quality Management System
RFP	Request for Proposals
ROD	Record of Decision
ROW	Right-of-Way
RTD	Regional Transportation District
SCDOT	South Carolina Department of Transportation
SD	Stipulated Damages
SEP-14	Special Experimental Projects No. 14 (FHWA)
SH	State Highway
SHTD	State Highway and Transportation Department
SJH-TCA	San Joaquin Hills Transportation Corridor Agency (Orange County CA)
SJTA	South Jersey Transportation Authority
SNJLRTS	Southern New Jersey Light Rail Transit System
SR	State Route
TCA	Transportation Corridor Agencies (Orange County CA)
TEA-21	Transportation Equity Act for the 21st Century
T-REX	Transportation Expansion Project (CDOT/RTD)
UDOT	Utah Department of Transportation
U.S.C.	United States Code
UTA	Utah Transit Authority
WBS	Work Breakdown Structure
WMATA	Washington Metropolitan Area Transit Authority, DC
WSDOT	Washington State Department of Transportation

DESIGN-BUILD PRACTICE REPORT

1.0 Executive Summary

New York State Department of Transportation is currently considering legislation that would allow a demonstration program utilizing design-build services in a limited number of transportation projects. The Department is therefore in the process of developing procedures for acquiring and administering design-build services.

One of the initial tasks of the process is to collect information and review the current policies and procedures followed by federal, state and local agencies, and in particular, other state transportation and highway agencies, concerning the use of design-build contracts. This report describes the major components of the design-build process and summarizes the practices of the various agencies utilizing design-build services. Of particular interest were the practices of each agency with regard to selection of projects for design-build, legislative authorization, allocation of risk, and administering and overseeing design-build contracts. Agencies were also asked to identify any particular lessons learned.

The primary vehicle for gathering information concerning the use of design-build was a survey of and discussions with agencies identified as having significant experience utilizing the design-build delivery method for capital construction projects.

The information gathered shows that design-build has proven to be a successful alternate way of implementing a project. The report found that the use of design-build contracting can achieve a savings in project duration and reduction in cost, and expands the potential for use of innovative construction technology, while at the same time maintaining the durability and quality of transportation projects. These benefits are often achieved with no increase in the size of the agency staff.

2.0 Description of Survey and Interview Approach

2.1 Survey Background

Design-build is a project delivery method under which a project owner, having defined its initial expectations to a certain extent, executes a single contract for both architectural/engineering services and construction. The design-build entity may be a single firm, a consortium, joint venture, or other organization. However, the fundamental element of design-build delivery remains that one entity assumes primary responsibility for design and construction of the project.

Design-build has long been used by some project owners (including the U.S. Department of Defense and the power industry) as a project delivery method. Starting in the late 20th century, private sector use of design-build, primarily for vertical buildings, expanded rapidly. Interest in design-build delivery spread more gradually

within the public sector, and was primarily used for vertical projects but also included horizontal transportation projects.

A number of factors have led owners to consider the design-build approach. Design-build delivery provides owners with the benefit of a single point of responsibility for the majority of project development, which can streamline coordination between the design and construction teams. It can reduce the owner's administrative burdens by eliminating the need to coordinate or arbitrate between separate design and construction entities. With the primary designer and the contractor working as a team, scheduling considerations can be addressed up front, often leading to more efficient implementation. Together with these efficiencies, the fact that design and construction activities can proceed concurrently also creates the potential for time savings and, ideally, will lower implementation costs. Design-build can also promote innovation by utilizing the designers' and builders' separate strengths to develop new design and construction techniques. The innovations can be included in proposals in order to gain a competitive advantage in the selection process, or as part of the project implementation phase in order to cut costs, speed implementation, or gain maximum benefit from any incentive programs. Because of these factors, design-build delivery is often chosen for complex projects or when fast track implementation is a priority. Design-build contracts are frequently on a fixed-price basis, thus providing cost certainty at a relatively early stage of project planning. This is particularly beneficial for projects facing budget limitations and can be a key factor in obtaining project financing.

In order for the Department to become familiar with the current industry practices related to design-build, it was necessary to collect information and review current practices and procedures used by agencies in connection with design-build contracts. This report documents the results of the information collection process, and discusses how other agencies address matters that will be relevant to NYSDOT in setting up its design-build program. The report identifies the criteria used in selecting projects for design-build, the procurement procedures, contract terms, and conditions, the allocation of risk, and the general administration and oversight of the design-build process.

2.2 Survey Development and Identification of Agencies to be Interviewed

It was determined that more information could be obtained by undertaking an in-depth survey of agencies actively using (or actively interested in using) design-build, rather than sending out a general survey to a large number of agencies. A written questionnaire would be distributed to the selected agency and then supplemented by interviews and discussions with representatives of those agencies.

A survey questionnaire was drafted (see Section 2.3 below) and a list of agencies was developed that focused on the state DOTs and other agencies that are using innovative applications of design-build contracting. The Federal Highway Administration Special Experimental Projects No. 14 (SEP 14) listing of design-build projects was used as a resource for identifying state DOTs using design-build contracting. The total list of state DOTs using design-build, from SEP 14, is shown in Appendix 1. In addition, surveys were conducted to identify and determine the appropriate states/agencies to be

interviewed. These are contained in Appendix 2 - Survey of Public Agencies That Have Utilized Design-Build Transportation Projects, Appendix 3 - Survey of Transportation Agencies That Have Design-Build Authority, and Appendix 4 -Recommended List of States/Agencies to be Surveyed.

Ten agencies were selected for an interview approach, with extensive follow-up to encourage them to complete the surveys. Survey forms were also sent to another eight agencies with a request that they respond in writing with reduced follow-up.

The ten agencies that were selected for in-depth interviews are:

- Alameda Corridor Transportation Authority (ACTA)
- Arizona Department of Transportation (ADOT)
- Colorado Department of Transportation (CDOT)
- Federal Highway Administration (FHWA)
- Florida Department of Transportation (FDOT)
- Naval Facilities Engineering Command (NAVFAC)
- Ohio Department of Transportation (ODOT)
- South Carolina Department of Transportation (SCDOT)
- Orange County Transportation Corridor Agencies (in California) (TCA)
- Utah Department of Transportation (UDOT).

Surveys were also sent to the following eight project owners whose input was considered desirable:

- South Jersey Transportation Authority/New Jersey Department of Transportation/MGM-Mirage (Tri-Venture) aka "Atlantic City/Brigantine Connector" (AC/BC)
- Greenville County, South Carolina
- Maine Department of Transportation (did not respond)
- Michigan Department of Transportation (did not respond)
- Minnesota Department of Transportation (did not respond)
- Northwest Parkway (in Colorado) (did not respond)
- Utah Transit Authority (UTA)
- Washington State Department of Transportation (WSDOT).

Of the 18 selected agencies, the following chose to participate in the survey:

- Alameda Corridor Transportation Authority (ACTA)
- Arizona Department of Transportation (ADOT)
- South Jersey Transportation Authority et al (Atlantic City/Brigantine Connector) (AC/BC)
- Colorado Department of Transportation (CDOT)
- Federal Highway Administration (partial response)
- Florida Department of Transportation (FDOT)

- Greenville County, South Carolina
- Naval Facilities Engineering Command (NAVFAC)
- Ohio Department of Transportation (ODOT)
- South Carolina Department of Transportation (limited response)
- Orange County Transportation Corridor Agencies (TCA)
- Utah Department of Transportation (UDOT)
- Utah Transit Authority (UTA)
- Washington State Department of Transportation (WSDOT).

The list of contact information for the agencies that were surveyed can be found in Appendix 5 – Interview and Survey Mailing List for NYSDOT Design-Build Survey.

2.3 Outline and Rationale for Survey Questions

The questions and topics addressed in the survey questionnaire cover a broad range of topics, with the goal of obtaining specifics on the design-build practices used by the respondents, as well as information that would be helpful to NYSDOT in its efforts to obtain legislation authorizing design-build and in its subsequent implementation of design-build. The questions were often purposely open-ended, to elicit insight on the subject and allow for flexibility to expand the interview when that seemed appropriate. The survey covered the complete design-build process, including project selection, the procurement process, management of the design-build contract, enforcement of warranties and post-completion maintenance obligations.

The survey document was attached to a cover letter from the Chief Engineer that explained the purpose of the survey, and promised that agencies that participated would receive a copy of the final Design-Build Practice Report.

The major sections of the survey are listed below. A copy of the cover letter with a complete survey document can be found in Appendix 6.

Design-Build Industry Practice Survey Outline

1. General Information
2. Project Background
3. Procurement Process
4. Development of Procurement Package
5. Project Management
6. Payment
7. Schedule
8. Right of Way/Utilities
9. Risk Allocation
10. Change Orders
11. Warranties/Maintenance
12. Subcontractors/DBE/EEO/Key Personnel
13. Insurance/Bonds/Indemnities/Limit on Liability

3.0 Summary of Survey Responses

3.1 General Information and Project Background

Each agency was asked to provide information about itself and its use of design-build, including whether the agency had specific enabling legislation allowing design-build and how it dealt with opposition to the use of design-build. The agencies were also asked to provide information about their design-build projects, including the criteria used to identify projects appropriate for design-build, in order to obtain a greater understanding of their responses. The survey responses are contained in Appendix 7 – Completed Surveys (issued as a separate attachment to this report).

The Alameda Corridor Transportation Authority (ACTA):

ACTA is a joint powers agency formed by the Cities of Los Angeles and Long Beach to finance and develop the Alameda Corridor project, a rail/grade separation project connecting the Ports of Los Angeles and Long Beach to rail yards and other transportation facilities in central Los Angeles. ACTA has used design-build for a single, but significant, contract, as an integral part of its plan for delivery of the Alameda Corridor. It obtained special authorization from the Los Angeles City Council to use an alternative procurement process for the design-build contract, basing selection on a lowest ultimate cost evaluation (evaluating the Authority's costs including operation, maintenance and right-of-way expense, as well as the design-build contract price), followed by limited negotiations. The Mid-Corridor Design-Build Project represents approximately two-thirds of ACTA's construction budget.

ACTA's Mid-Corridor Design-Build Project includes a 10-mile, 33' deep trench, extending from a point north of State Route 91 to a location near 25th Street in Los Angeles, and includes construction of a rail line immediately east of the existing tracks and the trench, allowing trains to continue through the area during the trench construction period. Improvements were also made to Alameda Street, with bridges constructed to carry street traffic over the trench at 29 crossings, and other roadway improvements were made at several locations.

ACTA's decision to use design-build was intertwined with its plan of finance, which included the sale of bonds secured by future fees to be paid by the railroads using the Corridor. In order to maintain acceptable coverage ratios and keep interest expense within an acceptable range, the project had to open for revenue service within a certain time period after issuance of the bonds. This time constraint, combined with the critical need for the project to be completed, required the Authority to use design-build.

The Authority's overall goals in developing the Corridor were (in order): time, price certainty, quality work product, reduced impacts to adjoining properties, and sharing the benefit of jobs with adjoining communities. Use of design-build for the Mid-Corridor Project definitely helped to meet the first two goals of time and price certainty. Design-build accelerated the project's total schedule by 18-20 months. The Mid-Corridor Project is currently valued at \$770 million — an increase of approximately 8% over the

initial contract price. Some of that increase was due to shifting work from other projects into the design-build contract. There was probably no effect on the third and fourth goals of quality work product and reduced impacts to adjoining properties. A job training and local hire program was included by the design-build team to meet the fifth goal of sharing the benefit of jobs with adjoining communities. ACTA has absolutely met its goal and considers its design-build program to be successful.

Arizona Department of Transportation (ADOT):

ADOT has used design-build for a number of different projects including freeway widening, interchange reconstruction, and changing 2-lane highways to 4-lane divided highways. The values of its design-build projects range from \$3.5 million to \$185 million. Enabling legislation was co-sponsored by ADOT, AGC, and the local consulting engineers associations. Opposition from contractors, through lobbying of elected officials, resulted in a requirement that design-build projects must exceed \$40 million and that design-build can be used for no more than two projects per year.

ADOT met its goals of quick construction within a reduced budget. The benefits achieved by using design-build included time reductions of approximately 30%, and cost savings of 5-6%, compared to design-bid-build.

New Jersey Department of Transportation (NJDOT) et al (Atlantic City/Brigantine Connector) (AC/BC):

The Atlantic City/Brigantine Connector (AC/BC) is a special one-time project that was accomplished by a public-private partnership, stemming from a request for proposals issued by Atlantic City for development of the Marina district "H-tract," the former city dump. Mirage Resorts won a bid to develop a \$750M casino resort in the area. In order to obtain access to the site, a Mirage affiliate entered into an agreement with the NJDOT and the South Jersey Transportation Authority whereby each party would contribute one-third of the cost of a tunnel connecting the Atlantic City Expressway with the Marina district and Brigantine Island. The design-build contract was considered a public works contract due to funding by NJDOT and the South Jersey Toll Authority, and was procured using the same competitive bidding process required for NJDOT contracts (i.e., award to the lowest responsive, responsible bidder).

The Atlantic City Brigantine Connector's 2.5-mile route includes a 2,000-foot cut-and-cover tunnel, 10 new bridges and 2.3 miles of new highway, with 15 ramps, 23 retaining walls, interchange modifications, drainage, landscaping, traffic signals, highway lighting, curbs, median barriers, and impact attenuators. Numerous utilities were installed or relocated during the project. The scope of the work also included environmental mitigation measures, a landscaped park, and pedestrian bridges. Many local streets were widened and resurfaced, and several city blocks of residential housing, as well as portions of the Atlantic Energy power facility, were either demolished or relocated. The tunnel, which goes under US 30 and a residential area, includes storm water pump stations, ventilation, and related electrical and mechanical systems.

The goal in using design-build was to shorten the time as much as possible, and also to obtain cost certainty. The contract was awarded to a joint venture for a bid price that was \$30 million less than the engineer's estimate. The Contract included a \$28 million contingency available for a broad range of risks. This represented the limit of liability of the project developer and the public agencies funding the project. The contractor received 85% of the contingency funds remaining at the end of the job.

Colorado Department of Transportation (CDOT):

CDOT obtained legislation in 1999 authorizing it to use a best value procurement process for design-build contracts. Before obtaining such enabling authority, CDOT contracted for a few smaller design-build projects (less than \$50 million) on Interstate rehabilitation projects using a low bid selection process. CDOT used its best value selection process for the first time in 2001, awarding the \$1.186 billion design-build contract for the T-REX project, a major highway reconstruction and light rail transit project.

The T-REX project involves improvement of approximately 17 miles of Interstate 25 and Interstate 225 in the Denver metropolitan area and adds approximately 19 miles of new light rail transit line, including 13 new stations and improvements to the existing Broadway station. The proposers were also requested to price various options including additional bridge replacement and pedestrian overpasses and bus plazas.

CDOT was advised of concerns about design-build on the part of both contractors and consultants during the legislative process and also the rule-making process. The concerns included fears that all projects would utilize design-build, that smaller contractors would not have the opportunity to compete, that larger out-of-state contractors would take over, and that contractor/consultant relationships and DBE involvement would be adversely affected. Most of the concerns were addressed through the formal rule-making process, which established task groups including participation from external stakeholders (contractors and consultants). Allowing those stakeholders to participate in the process and to assist in developing the rules helped address most of the issues raised.

CDOT believes that its goals for the T-REX project will be met. The contractual completion deadline is almost two years ahead of the project completion goal. CDOT anticipates lower project costs in a number of areas, including inflation, administrative costs, and user costs. Their top goal was to "minimize inconvenience to the public". CDOT anticipates using design-build in the future.

Federal Highway Administration (FHWA):

FHWA used design-build for a roadway project in Yosemite National Park, using the “two-phased” Design-Build selection process permitted under the Federal Acquisition Reform Act of 1996. FHWA says that design-build provides the following benefits:

- Single point responsibility for design and construction to mitigate conflicts between the contractor and the designer
- The ability to fast-track the delivery of a completed project
- Potential to lower overall costs
- Earlier use of the completed facility
- Reduction in contract growth potential by shifting risk and partial control to contractor.

FHWA has experienced very little opposition to its use of design-build, and has experienced only learning curve issues.

Florida Department of Transportation (FDOT):

The Florida Department of Transportation obtained legislative authorization to use design-build a number of years ago, and also received programmatic authorization from FHWA to use design-build for federally funded projects. In starting their program, they found the main opposition was centered around change. Contractors were reluctant to move away from low bid. Consultants disliked the idea of having to bid or negotiate for their services with a contractor rather than the Department. The agency did a lot of talking and working through their concerns and started with a few pilot jobs. They now have an extensive program managed by the individual districts, with 40 to 50 design-build projects to date. Design-build is used as one of the tools in the toolbox to cut project delivery time, reduce/eliminate cost overruns/claims, gain efficiency in processes, and improve professionalism/quality. Design-build has allowed FDOT to cut project delivery time by 1/3, with very few claims. They believe that the products are higher quality, and report more enjoyable working relationships with the industry. Their new economic stimulus package includes about 25 jobs worth \$425 million in design-build projects. By the summer of 2002, they will have over \$1.3 billion in design-build projects under construction.

FDOT’s design-build contracts have resulted in accelerated project delivery schedules and very few price changes, according to a 1991 University of Florida study of the agency’s pilot design build program which determined that costs were slightly higher in design-build, although road user delays and business impacts due to time overruns were not taken into account. The agency believes that over time, they should become better at scoping jobs (clearer outcomes) and the industry should become more comfortable with the risks, and that as a result prices should come down.

Greenville County, South Carolina:

This local agency successfully uses design-build for the implementation of its annual road improvement program, now in its 5th year, as well as for the construction of several public buildings, including a courthouse, courthouse expansion, parking garage, detention center, library, parking lot, and forensics lab renovation. The County's road program has included paving of more than 800 roads, correction of associated drainage, improvement of intersections, installation of speed humps, repair of sidewalks, building new sidewalks, and installation of guardrails. Also, through the road program, four bridges, six intersections, two major road widenings, and four minor widening projects have been developed using design-build. Greenville's decision to use design-build was based in part on a desire to minimize staff workload so that it could continue to provide other services without staff size increases. The County uses design-build to move away from money as a sole selection factor, using a form of best value selection by evaluating technical/quality factors, which include factors for scope and time, within a fixed, stipulated sum price. The County lists a number of projects to be completed and negotiates with proposers regarding which projects will be performed for the stipulated price. The contract is awarded to the proposer who will perform the greatest amount of work for that price.

The County has faced opposition to its use of design-build, including lawsuits brought by a retired contractor challenging the need for design-build. It has also had unsuccessful contractors express concerns to elected officials regarding the selection process.

Design-build has helped the County to meet its goals. It has largely used one contractor. The program has saved time by avoiding the need to develop separate procurement packages and select separate firms for multiple design and construction projects, since a single firm coordinates all projects elements (design, utility coordination, right of way acquisition, and construction). The County also says that it has lowered costs by utilizing value engineering with 100% of the savings returned to the County to be used on other projects.

Naval Facilities Engineering Command (NAVFAC):

NAVFAC responded to the survey providing a programmatic perspective including all the Military Construction (MILCON) projects for which NAVFAC is the design and construction agent. MILCON projects range in size from \$750,000 to as much as \$50 million or more, typically averaging around \$5 million. The annual MILCON program averages approximately \$1.2 billion. Projects include a broad spectrum of types of facilities, including operational, training, bachelor housing, community, utilities, and other infrastructure. Design-build has become an effective acquisition tool for NAVFAC, with positive effects on acquisition and construction time, project costs, administrative effort, construction quality, and has improved contractor innovation and use of emerging technologies. NAVFAC's use of the design-build acquisition approach has risen sharply the last several years. It currently represents 60% of the MILCON program (by number of projects), and is the agency's procurement strategy of choice. NAVFAC anticipates

that design-build use will remain at that level or increase slightly for the foreseeable future. Design-build provides both the potential for saving time and money by having a single contractor provide both the design and construction in a one-stop process, and the potential to reduce claims by having a single entity responsible for coordination of plans, specifications, and submittals.

NAVFAC uses the procurement process authorized by the Federal Acquisition Reform Act of 1996 (but used design-build years before that legislation was passed).

Its project funding comes from MILCON appropriations, which have a five-year life for incurring new obligations. MILCON design and construction funds are received as two separate appropriations from Congress. Appropriation law and DOD Financial Management Regulations stipulate that only construction funds can be used on a construction contract, and a design-build contract is considered a construction contract. Therefore, it had to readjust how it budgeted for construction funds for the design-build portion of their MILCON program in order to pay for the contractor's design cost (estimated to average approximately 4% of the estimated cost of construction) with construction funds. This change took several years to accomplish. During the interim it had to deal with a growing surplus of design funds and a corresponding burden on construction funds due to the unbudgeted contractor's design cost.

Design-build helped the Navy to achieve its goals of time savings, cost savings, and innovation while maintaining quality and not increasing in-house labor requirements. "... it is apparent that we have achieved dramatic time savings through design-build. Anecdotal data shows as much as two-thirds reduction in total time on some projects."

The Ohio Department of Transportation (ODOT):

The ODOT design-build program started in 1995 with six pilot projects. In 1999 the program was expanded to \$250 million per biennium. The project types included bridge replacements, resurfacing, lane widening, deck replacements, bridge painting, concrete pavement overlay, and adding lanes of pavement, tower lighting, sign replacement and noise wall construction. The contract prices ranged from a \$197,000 bridge replacement to a \$45,000,000 lane addition and pavement replacement.

Currently, the ODOT design-build program is operating under temporary legislative authority of \$250 million for fiscal years 2002 –2003. The ODOT began using design-build as an innovative program to utilize contractor innovation, to help facilitate the construction program and as a method to quickly replace a deteriorating road infrastructure. ODOT's specifications are prescriptive in nature, and this (they say) reduces the impact of risk to the contractor.

ODOT's program goals are lower overall project cost, shortened timeframe from project design to construction, a smaller number of change orders and encouraged contractor/designer innovation. ODOT has realized all of these goals. The ODOT design-build program has been very successful, resulting in substantial time and cost savings. The time between the start of design and the start of construction in an

average ODOT design-build project has been reduced by about 50% because of the ability to fast-track the project. The time savings shortens the total project duration. ODOT has learned new innovative construction techniques that are currently being implemented into the traditional design-bid-build program. ODOT plans to seek permanent legislation to use design-build for the next biennium (FY's 2004-2005)

Orange County Transportation Corridor Agencies (TCA):

The San Joaquin Hills Transportation Corridor Agency and Foothill/ Eastern Transportation Corridor Agency (TCA) are joint-powers agencies formed by the County of Orange and various cities within the County of Orange to develop the first modern toll roads authorized in California, totaling more than 68 miles of transportation facilities at an estimated cost exceeding \$3 billion. TCA has used design-build for four different roadway projects:

1. The San Joaquin Hills Transportation Corridor, an extension of the Corona del Mar Freeway (Route 73) in Orange County, California, consisting of a six-lane, divided, limited-access highway of approximately 15 miles with related structures, equipment and systems. The project was completed with only a 2.2% increase in the contract price, notwithstanding a 14-month injunction affecting the middle section of the project.
2. Portions of the Foothill and Eastern Transportation Corridors (SR 231, SR 241 and SR 261). The initial contract price for that project was \$712 million and ended at \$776.9 million. The 9% increase was due to scope changes (8%) and changed conditions (1%). Both of these projects were funded with toll revenue bonds.
3. The Foothill-South Transportation Corridor, a 16-mile project that will connect the Rancho Santa Margarita area with Interstate 5 in San Clemente. The project was awarded prior to completion of the environmental review process and is still going through that process.
4. The Glenwood Pacific interchange, a project that needed to be modified in order to fit within a \$7 million budget.

TCA's initial decision to use design-build was based on funding limitations. Its primary source of revenue to pay for the costs of developing its network is toll revenues, and it determined in mid-1990 that it would be able to issue project revenue bonds only after it had a contract in hand to design and build the project for a fixed price. The Agency's primary goals in using design-build were to obtain completion on or ahead of schedule, without cost overruns. Design-build helped the Agency to meet its goals because the San Joaquin and Eastern projects could not have been financed and built conventionally. It analyzed schedule growth for various design-build and design-bid-build projects and found a significant time savings by utilizing design-build. For San Joaquin, although the price was higher than expected, design-build made the job financeable. For the Eastern toll road, according to the TCA, "... the price obtained was

probably lower than the cost to design and build conventionally. (The contractor left \$114 million on the table between the first and second bidder.)” The project also benefited from reduced interest expense due to accelerated delivery. Portions of the projects were phased due to funds not being available all at once.

TCA’s design-build program has been an absolute success. Without design-build the TCA would not have had a project. Benefits of design-build include expedited delivery plus cost certainty through transfer of risk and responsibility.

Utah Department of Transportation (UDOT):

UDOT has used design-build on very large (I-15 Reconstruction Project at \$1.56 billion) and relatively small (\$1 million US 6 slide remediation) projects that were time sensitive. DOT also has a \$300 million freeway project (the Legacy Parkway) and a \$6.5 million retaining wall project (US 189 Vivian Park in Provo Canyon) under contract

The I-15 project involved the reconstruction of approximately 17 miles of urban I-15, and included widening the corridor from 6 lanes to twelve lanes, the complete construction of 144 bridges, a new downtown interstate interchange, reconstruction of 13 freeway interchanges and three interstate junctions, frontage road improvements, three railroad grade separations, and installation of an Advanced Traffic Management System throughout the metropolitan area. I-15 had an initial contract price of \$1.36 billion and a final contract price of \$1.325 billion. (The initial program cost estimate was \$1.53 billion; final program cost was \$1.50 billion.) UDOT’s goals were to minimize disruption to businesses and the traveling public, provide project delivery in a timely manner (prior to the 2002 Olympic Winter Games), minimize costs, and achieve a high quality highway project. One of the primary reasons for deciding to use design-build was the projected time savings. UDOT’s project managers estimated it would take eight years to design-bid-build the project; with design-build the time was shortened to four years and two months. The highly successful I-15 project was the first time that a major, publicly funded, interstate highway reconstruction project combined all of the following: the design-build delivery method, highway performance specifications (developed as part of the RFP preparation), shared risk, best value selection (using an adjectival rating method), long term maintenance (and warranty), ISO 9001 registration (required), an award fee incentive (\$50 million), stipends (to unsuccessful proposers), design oversight (no design submittals to UDOT), QA/QC performed by designer-builder, and expedited payment (7 days).

The Department’s second major design-build project is the Legacy Parkway, a four-lane, limited-access, divided highway extending approximately 13.5 miles from I-215 at 2100 North in Salt Lake City, northward to I-15 and U.S. 89 near Farmington City. This project crosses a highly sensitive wetland area and the contract includes numerous provisions to ensure that all required environmental mitigation measures are fully implemented. The contract was awarded in late 2000 and is currently the subject of an environmental injunction issued by the U.S. Court of Appeals, Tenth Circuit.

One of the major reasons for use of design-build is to respond to the public's demand that UDOT minimize the time span and the resulting public impact of major projects. UDOT uses design-build to be more responsive to the public, to have more control over costs, to deliver projects more quickly, and to obtain the best value for public dollars. UDOT took the necessary time to educate everyone in the process, including the Governor, the State legislature, contractors, consultants, State employees, the public, et al. They consider the design-build program to be a success because they now have a high level of acceptance from the public. "They believe that we will do what we say we will do", said Carlos Braceras, Deputy Director of UDOT.

UDOT thinks that design-build project costs are lower than the cost of design-bid-build projects, because of the efficiency of all operations being under the control of one entity and economies of scale. On their two completed design-build projects there were no contract increases for the basic work included in the contract packages.

Utah Transit Authority (UTA):

UTA has used design-build to design and construct a critical light rail project -- the University Line project, which needed to be completed prior to the Olympic Winter Games of 2002 in Salt Lake City. UTA awarded a design-build contract in 2000 for this 2.3-mile project connecting the University of Utah community to the Salt Lake City central business district.

The initial contract price for the University line was \$72 million. The final amount was slightly higher due to owner/stakeholder-directed changes for betterments and for incentive fees provided in the contract. The contract amount increased by approximately 2% due to contractor-initiated changes.

The initial schedule for the project was 27 months. One proposer withdrew prior to submitting a proposal because they felt that 27 months was too aggressive. The successful proposer completed the work in 18 months.

UTA had a tight budget with a small contingency. It is the UTA's belief that the University Line was more expensive per mile than the previous design-bid-build rail project the UTA had recently completed. As a result, the perception is that the University Line cost more to develop as a design-build project than it would have cost using a conventional delivery methodology. However, the University LRT project had more stringent maintenance of traffic and access requirements, included significantly more public/community relations work, and was working on a tighter completion schedule to finish before the Olympics Winter Games (the project could not have been completed in time for the Olympics using the traditional, design-bid-build delivery method), all of which drove the cost up. Nevertheless, the project was within UTA's budget. "Design-build provided additional assurances to the UTA in meeting program cost goals." (Michael Allegra, Director of Transit Development, UTA) The goals for the project were: (1) the project was to be completed in a very short period of time (prior to the beginning of the 2002 Olympic Winter Games), (2) program costs needed to remain below \$118 million, and (3) the quality of the project was to be at a level equal to the

previous rail projects completed by the UTA. All of these goals were met. The project is considered a great success.

Washington State Department of Transportation (WSDOT):

WSDOT has used design-build on one pilot project utilizing a best value approach and is in the process of negotiating a design-build contract for the Tacoma Narrows Bridge. (WSDOT had previously entered into an agreement with a firm to finance, design, build and operate the bridge, in response to a proposal submitted under WSDOT's public-private partnership law. The developer had entered into a design-build contract with a joint venture. The project is now being restructured for the facility to be publicly financed, owned, and operated.) WSDOT's pilot project was a \$22 million grade separation. The legislative goal on the pilot project was to minimize budget and time. WSDOT "feels that the goal of minimizing total project delivery time will be realized." Preliminary estimates show that initial cost was higher than a design-bid-build project, but cost growth to date has been lower than for a standard project. The project was funded out of the safety improvement program, but future large corridor projects will require special funding sources.

WSDOT will likely utilize design-build for corridor level projects in the Seattle-Area (projects ranging from \$200 million to \$2 billion). Enabling legislation was required, and they recently received legislative authority to utilize design-build on publicly funded transportation projects. WSDOT feels that design-build is an important tool in the delivery of their transportation program. The two primary benefits that WSDOT anticipates from design-build are a faster delivery timeline coupled with a lessened WSDOT staff requirement.

3.2 Criteria Used to Identify Projects Appropriate for Design-Build

Each agency was asked to provide the criteria used to identify projects appropriate for design-build. The following briefly summarizes their responses.

Several agencies said that they would consider using design-build only where expedited project delivery was necessary or where design-build could be shown to increase the agency's chance of success in meeting project goals and objectives. Some agencies said they would consider using design-build only after right-of-way, utility, and environmental risks were cleared. Other agencies considered design-build as a tool appropriate for many different projects, to be evaluated on a case-by-case basis, taking into account factors such as time, size and type of project, and project cost.

NAVFAC provided the following description of the process that it follows in deciding whether to use design-build. NAVFAC reviews each project to formulate an acquisition plan based on the specific circumstances of that project. It stated that its experience indicates design-build can be a successful strategy when all or most of the following are true:

- Project scope is well defined;

- Project requirements for the most part can be stated as performance specifications;
- Project value is sufficient to attract competition;
- Project location, security requirements, or other factors will not overly restrict competition;
- Little or no design is required in order to advertise the design-build contract;
- Completing NEPA requirements will not significantly delay contract award;
- A different acquisition method would not produce better pricing, life cycle cost, or overall time;
- There are no acceptable plans and specifications from another similar project that can be re-utilized with minimal effort;
- The (internal Navy) client is on board with using this approach.

3.3 Procurement Process

3.3.1 Two-Step Process

The majority of the responding agencies use a two-step process for procurement of design-build contracts. The first step involves pre-qualification of firms (shortlisting where permitted by legislation) based on their responses to a request for statements of qualifications or equivalent documentation. Shortlisting serves to reduce industry costs in responding to requests for design-build proposals, to encourage the most qualified designers-builders to participate by increasing their chances of success, and to reduce the cost to the agency of reviewing the proposals. The standard in the industry appears to be to shortlist three to five teams. Some agencies do not shortlist proposers but will pre-qualify firms.

The second step is issuance of a request for proposals (or invitation for bids in some cases) and evaluation of technical and price proposals from the pre-qualified/shortlisted teams. The second step may include the opportunity for the design-build teams to obtain pre-approval of alternative technical concepts, and may include discussions/negotiations followed by subsequent proposals (best and final offers).

Most of the agencies using the two-step process awarded their contracts based on a best value determination made following evaluation of initial or final proposals. Federal law requires federal agencies to follow such a process for design-build projects. Legislation in a number of states (including Arizona, Colorado, Utah and Washington) allows transportation agencies to use such a process. Several agencies (Ohio, NJDOT, TCA) have awarded design-build contracts on a low-bid basis, setting a high responsibility standard for the proposing teams, including minimum requirements for the

design firms participating in the process. ACTA selected its design-build contractor based on a lowest ultimate cost determination (taking into account the agency's future costs based on the proposal submitted), and preceded by limited negotiations prior to award, based on procurement authority contained in a city charter. The TCA selected a designer-builder based on preliminary pricing, with the final price to be established upon the designer-builder's completion of the preliminary design. (It did not have specific legislative authorization to use such a process, but its procurement authority was held valid by a Superior Court decision.) Greenville County selected its designer-builder based only on the quality evaluation of qualifications/technical proposals (including factors for scope and time), within a fixed, stipulated sum price, followed by negotiation of fees for management and design, and target prices for individual projects based on a price breakdown submitted following selection.

3.3.2 Variations on "Best Value"

There is no single generally accepted approach to determining best value. Many agencies adopt formulas, while some advocate use of an adjectival (descriptive) comparison. NAVFAC has tried both approaches, and provided the following thoughts on the subject:

About 7 years ago NAVFAC abandoned a point scoring system based on equating \$ to quality points because it was difficult to administer and defend (very difficult to explain the very small point differentials to proposers). An adjectival grading system was adopted to evaluate technical factors and is currently used. Technical proposals are generally evaluated in terms of being exceptional/outstanding, acceptable/satisfactory, marginal/deficient but correctable, or unacceptable. Price is usually evaluated inclusive of options. The RFP always specifies the relationship between technical factors and price and it varies by project. Price and technical factors are equal for the majority of our design-build procurements. Occasionally, technical factors are considered significantly more important than price. Even less often is price considered significantly more important than technical factors.

Best value is determined by evaluating whether the price increase of one acceptable proposal compared to the next lower priced acceptable proposal is commensurate with an increase in the ranked technical quality of the higher-priced proposal. When the next higher price is not matched by a commensurate increase in technical quality, the previously observed proposal is the "best value" and the contract may be awarded to that proposer.

Agencies that have used best value formulas include ADOT, FDOT, UDOT (one project), UTA (a modified adjectival rating on one project), and WSDOT. Regardless of whether a formula or adjectival approach is used, the criteria that are the basis for the evaluation will differ depending on the type of project, the agency's project goals, and other factors.

3.3.3 Industry Review Process

Although some agencies do not ask the shortlisted teams to participate in an industry review process (where the draft RFP is shared with and reviewed by the industry), the majority of the agencies strongly endorsed use of such a process. Comments included:

ACTA: “Without an industry review we believe we would have received fewer proposals. We delivered a contract summary plus select concept schematics to the shortlisted teams. The industry review resulted in some changes to risk allocation for differing site conditions, utilities, etc. -- no technical changes.”

FDOT: uses an industry review process to get the benefit of the proposer’s ideas and questions to help clarify the criteria.

Greenville County: an industry review process results in better “buy in” by the construction community.

NAVFAC: “We have used industry reviews of draft RFPs very successfully. These forums have resulted in better RFPs and better industry understanding of our requirements.”

WSDOT: used the process and commented: “The industry review process is vital to a successful project for WSDOT. The sharing of ideas in a public forum is a cause of concern to designers-builders seeking a competitive edge.”

TCA: “The industry review was necessary in order to retain bidder interest in the projects. For the San Joaquin project, the initial approach taken in the contract was to shift virtually all risk to the contractors. When it became apparent that industry was not willing to accept that much risk, TCA conducted one-on-one meetings with the proposers, and modified the contract documents to retain greater risk. These meetings also served to give the proposers comfort that the project would proceed — San Joaquin was the first start-up, revenue-financed toll road to go to the markets. For the Eastern and Foothill-South projects, the industry review process resulted in fewer changes to the documents, but was otherwise comparable to the San Joaquin process.”

UDOT: For the I-15 Project, UDOT found out through industry reviews (continuing review of the draft RFP by the shortlisted firms) that the 20-year maintenance term included in its draft RFP was not acceptable to the shortlisted firms, and ultimately reduced the term to a 5-year option with renewals for up to another five years. The industry review is one of the techniques often credited with removing uncertainty (and contingency) in the minds of the proposers that led to only a 3.5% spread on the price proposals.

3.3.4 Protests Relating to Design Build Procurements

Although several agencies have dealt with protests relating to processing of design-build projects, there were no reports of protests to the concept of design-build, except in Greenville, SC (see Section 3.1). A protest regarding failure to pre-qualify was denied

for the Atlantic City/Brigantine Connector. TCA received a protest on its Foothill-South project, which was resolved without litigation. UTA denied a protest filed regarding its project from a contractor that did not submit a proposal. NAVFAC did not disclose how many protests it has received over the course of its design-build program, but did state that fewer protests were filed after the agency stopped trying to reduce the best value selection process to a formula.

3.3.5 Discussions/Negotiations

A number of agencies hold one-on-one communications with the proposers during the proposal preparation period after issuance of the RFP. In some cases these communications are limited to discussion of the acceptability (as opposed to evaluation) of technical concepts proposed by the shortlisted firms for inclusion in their proposals. In others the communications extend to general issues. Agencies that have used a technical concepts review include ACTA, CDOT, Greenville County, and UDOT. For the Utah I-15 project, this was another technique that was credited with leading to better pricing.

The procurement process used by federal agencies offers the opportunity for one-on-one discussions with the proposers after receipt of proposals, for the purpose of advising the proposer of any deficiencies (errors, omissions, weaknesses) in its proposal. Upon conclusion of these discussions (since it is a form of negotiations, it is also referred to as “negotiations” in some cases), the agency requests best and final offers (BAFOs), and bases the award on a review of the BAFOs. NAVFAC describes the process as follows: “Negotiations [discussions] strengthen the Government’s ability to obtain best value. During negotiations [discussions], the Government identifies aspects of an offeror’s proposal that it considers weak or deficient. Offerors revise their proposals based on that feedback. Negotiations [discussions] result in revised proposals with fewer, if any, weaknesses or deficiencies.”

Three of the agencies surveyed incorporated pre-award negotiations into the procurement process. Since these negotiations occurred after selection, they involved discussions of price as well as technical issues. UTA’s negotiations with the sole proposer resulted in a price reduction of approximately 20%. For ACTA, the negotiation process allowed ACTA to obtain clarifications regarding the selected contractor’s technical proposal, enabled ACTA to revise the scope of work to account for agreements with third parties that were signed after the proposal due date, and also resulted in a reduction in the contract price. The negotiation process for Greenville County’s projects is a critical part of the process since the breakdown of the stipulated price is not part of the initial selection.

3.3.6 Stipends

Stipends have been used by a number of agencies and are a means of reducing the cost to industry of participation in design-build procurement, as well as providing proposers partial compensation for agency ownership of concepts, that may be incorporated into the project or used elsewhere by the agency. The use of stipends

also tended to increase competition by allowing more firms to participate due to lower proposal preparation costs. There is no fixed formula for determining the appropriate amount of stipends:

- ADOT: 0.2% of bid amount
- CDOT: \$1,000,000 (\$1.186 billion project)
- FDOT: Varies – for each project, every losing firm with responsive proposal receives a stipend
- UDOT I-15: \$950,000 (\$1.36 billion project)
- UDOT Legacy Parkway: \$500,000 (\$300 million project)
- UTA: \$300,000 (based on original RFP for \$300M project)
- WSDOT: \$50,000 (\$22 million project).

Some agencies have provided for compensation to be paid to proposers only if their ideas are used. ACTA and the TCA provided for a share of any value engineering cost savings to be passed back through to the proposer who provided the original idea.

3.4 Development of Procurement Package

The appropriate level of design for a design-build procurement will depend on numerous factors, including the procurement process to be used, risk sharing decisions and project goals. Projects that are competitively bid are more likely to have a level of design in the higher ranges. A higher level of preliminary design is also more likely where prescriptive specifications are used. The surveys indicated that the designs included in the procurement packages were taken to the following levels:

- AC/BC: 20%
- ACTA: 5-15%
- ADOT: 10-20%
- FDOT: 10%
- NAVFAC: initially 35%, now ranges from 15% to 35% depending on complexity of project
- ODOT: 10-40%
- TCA Eastern: 35%
- TCA FTC-S: 5%
- TCA Glenwood: 35%
- TCA San Joaquin: 35%
- UDOT I-15: Overall 15%, but with wide variations among specific project components (for example; bridges, 0%; alignment and grade 30%, and geotechnical investigations, 95%)
- UDOT Legacy Parkway: 15%
- UTA: 30%
- WSDOT: 30-40% (less in future).

A number of agencies indicated a preference for performance specifications where possible, but almost all of the agencies relied on prescriptive specifications for significant portions of the project.

3.5 Project Management

3.5.1 Reduced Level of Oversight

All agencies cited multiple meetings and communications sources for managing the project. In some cases, a program manager was hired; in other cases, the owner provided staff. FDOT stated that project management involved far less oversight than normal. They do not review design details. They just look to see that AASHTO criteria are met in design and that the contract is followed in construction. NAVFAC describes its role as follows: “The RFP, and any design included with it, is prepared either in-house or by outside consultants. Contractor proposals are evaluated by in-house resources. The subsequent review of the contractor's design is done by either NAVFAC or outside consultants. In-house resources perform construction oversight.”

3.5.2 Design Reviews

The surveys included the following information relating to design reviews by the project owner:

AC/BC: Construction can proceed following approval of design by Contractor's Quality Assurance Manager; one DOT staff assigned to project for on-board review, design exceptions specifically reviewed and approved.

ACTA: 3 - 4 submittals, reviewed by ACTA, comments reconciled. Because schedule was paramount, the contractor was allowed to proceed with construction without requiring all “i”s to be dotted and t’s crossed”. However, this early construction is at the contractor’s risk. If the construction is inconsistent with the final design requirements, the contractor is obligated to correct the construction work. (If the cost to correct is prohibitive an alternate remedy would apply; e.g., an asphalt pavement with low density may be left in place but with reduced or no payment for the work.) As of January 2002 (two months prior to the scheduled opening), final design had been approved for about two miles of the project.

ADOT: On site reviews; designer-builder certifies final plans; goal to allow early construction; approved segmental plans required prior to start of construction.

FDOT: Oversight, no review of design details, no formal approval, may allow work to start without plans.

Greenville County: Kickoff meeting held to discuss perceived problems and issues that need to be addressed. Concept plans (with alternatives) are developed with preliminary cost estimate. Staff reviews this concept and then a public meeting is held. Survey and preliminary design are completed. Field visit is made with design team, project manager, and County staff engineers. Final plans developed incorporating public comments and comments from County staff.

NAVFAC: Submittals are required at 35%, 90%, and final design stages. NAVFAC does approve the design, but only in the sense of accepting the design as being in conformance with the RFP. A 100% (final) design is not always required before the start of construction. It can vary by project. They also employ "fast track" design and construction where parts of the design are approved and notices to proceed with construction of the approved system(s) are given prior to complete design acceptance. Occasionally they also utilize unrestricted notice to proceed where they give the contractor latitude to proceed with construction prior to any required NAVFAC design acceptance. In the latter case, NAVFAC still accepts the design ultimately, but the contractor is given the latitude to proceed at his own risk.

TCA: Review of 35, 65, 95/100 submittals; specific approval to release design for construction "at risk." Under California law, in order to preserve sovereign immunity for design defects, the design must have been approved by a public employee with discretion (or by the governing board of the agency).

UDOT I-15: Co-location of designers, constructors and UDOT staff; over-the-shoulder reviews/participation by UDOT; design reviews and release for construction (both the responsibility of the designer-builder) based on contractor's construction schedule; few formal submittals. Legacy Parkway: co-location of design and construction staff and UDOT staff; milestone design review at critical points during the design process; formal agency approval prior to release for construction.

UTA: Co-location; Contractor-led design reviews at midpoint of completion and at release for construction stages; design approved with submittal and acceptance of as-builts.

WSDOT: WSDOT did not provide for at-risk construction. Design submittals for components had to be at 100% prior to beginning construction. All work had to be reviewed by WSDOT prior to being released for construction.

3.5.3 Construction QA/QC

Although only one question in the survey, the subject of construction QA/QC is always a design-build issue that elicits significant response. Quality of the construction end product is a goal of every project and is the reason behind a proliferation of criteria, standards, procedures, and processes that attempt to ensure quality in design-bid-build. The culture that is the product of the traditional approach to QA/QC is very difficult to change and to accept the concepts of design-build that require a trust in the designer-builder, combined with the assignment of responsibility to the designer-builder to produce a quality product.. This is especially true of the organizational entities in the Departments of Transportation tasked with administering contracts for compliance and quality. It is significant then to note that almost all of the respondents place QC responsibilities on the designers-builders, and most of the respondents place the responsibility of QA on the designer-builder while retaining a level of QA oversight (in the form of small on-site monitor staffs, auditing, and independent testing). A few still perform owner QA, and one agency shared QA with the designer-builder. The

respondents spoke also about the need for adequate staffing levels of the designer-builder's QA organization, its independence, and, for one project (Legacy Parkway), its additional responsibility to the owner. The survey results included the following relating to construction QA/QC:

- ACTA: The design-build contractor was responsible for QC and QA. ACTA required proposed staffing levels to be included in the proposal. Those staffing levels were the subject of discussions during pre-award negotiations.

ACTA reserved the right to conduct owner assurance testing and QA oversight, and in fact placed several field engineers on site to oversee the contractor's QA/QC efforts. Lack of contractor inspection, failure to issue non-conformances, and inappropriate approval of "use as is" were common, but manageable issues.

In general, ACTA believed the contractor's personnel did a good job on testing, but there was a lapse in documenting. ACTA also had some concerns regarding an apparent reluctance by the contractor to provide direction to subcontractors relating to problems with quality control and assurance.

Lessons learned: "We required the contractor to use an independent firm for quality assurance. The firm proposed was relatively small. We now believe we would be better off with a large firm having responsibility, and in fact would prefer the primary designer to play that role. We would also like to have the Engineer of Record provide a certificate at the end of the job regarding conformity of construction to the final design."

In general, ACTA believed it is not necessary for the owner to provide inspection, but that owner oversight is unavoidable. Transfer of inspection to the owner may result in re-design by the owner's inspectors and can also lead to claims.

- AC/BC: Originally the contractor was given responsibility for QA/QC – following award the owners initiated a change order and the third party consultant performing QA/QC services became a subconsultant to the owner's project manager.
- ADOT: ADOT handled construction QA/QC as follows:
 - QC — construction — design-build firm
 - QA — design-build firm and ADOT — specified checkpoints and sampling frequency
 - Independent assurance -- owner
- CDOT: As documented in the draft SEP-14 report on the T-REX Project, the Contractor will be responsible for construction QA and QC. The T-REX team will audit the contractor's QA and QC processes and provide independent verification of materials incorporated during construction.

The CDOT/Regional Transportation District (RTD) has the right to perform

oversight to assure that the contractor is complying with contract requirements. CDOT/RTD will use an audit approach, a technique of checking on a sampling basis, to determine whether the work is complying with the contract documents. The auditing will include:

1. Design auditing performed on drawings, specifications, and other design output.
2. Construction/operational auditing performed on construction and operational activities. Operational activities include requirements such as public information, health and safety, and project management.
3. Management system auditing performed on the implementation of the contractor's quality management plans.

During the preparation of the RFP, additional audit specialists were brought onto the owner's management team to coordinate an audit program, and to assist in the implementation of Compliance Auditing Services (CAS). The Work Breakdown Structure (WBS) developed for the project was extended to additional levels to identify deliverables, sub-deliverables, activities, requirement groupings and requirements. These were used to make up the sampling plan for the audit process. The owner's management team performed a risk assessment of the designer-builder's activities to assign risk factors of levels 1 through 3, which range from an activity that may result in imminent unsafe conditions to activities associated with workmanship and appearance. Along with the risk, the activities were rated for sampling frequency, scope, and timing. A database containing the activities, risk assessment, and other information was created in Excel and later imported to the CAS database. From the database, auditing records will be generated, on which the auditors can verify activity requirements. These records will be the basis of ensuring compliance with the contract and recommending payment to the contractor.

Members of the T-REX team that will be auditing the T-REX project attended accredited audit training and received certification under the International Register of Certified Auditors (IRCA) Quality Management System (QMS) Auditor Certification Scheme. The training gave the team an understanding of the principles and practices of audits of quality systems for compliance with ISO 9000:2000 Series Standard.

- FDOT: QA/QC program is part of designer-builder's technical proposal. "The firms are responsible to provide their game plan. The inspection team, whether they work for FDOT or contractor, identify shortcomings and work with firm to fix. Resolve issues thru good communications."
- Greenville County, SC: The designer-builder's geotechnical firm provides inspectors for each project and at each site where some type of paving operation is taking place. The designer-builder's design firm has a special construction

engineer on staff that makes periodic inspections and addresses field problems if they arise. County staff will meet with the construction engineer, geotechnical inspector, and Project Management QC person to resolve issues that arise in the field.

- NAVFAC: The contractor is responsible for providing a construction quality control (CQC) process. Enforcement is through government quality assurance. In general, we have not experienced any appreciable change in either design or construction quality, but we have experienced a significant reduction in conflicts and disputes.
- ODOT: The ODOT contractor currently does not perform QA/QC on its projects. ODOT personnel perform all inspection and testing of materials. The ODOT has not had any serious issues with design or construction quality. If that should occur, ODOT uses a Dispute Resolution and Administrative Claim Process to resolve any issues.
- TCA: Contractor QA/QC with owner's Construction Engineering Manager (CEM) providing 20% independent QA testing and oversight inspection. In a few cases CEM testing was used for acceptance where the contractor testing failed.

In general, the contractor was good at testing but not inspection. The number of inspectors on the job was a frequent topic of discussion. There were never enough people, and they were inevitably underqualified.

For future projects, TCA would have the contractor perform testing, but would change to owner agent inspection.

If TCA had responsibility for maintenance of the project following completion, it would consider requiring the contractor to perform long-term maintenance, and to pay lane rental for repair/replacement work during the maintenance period.

TCA's former Director of Design and Construction reports that the cost of construction QC should be somewhere between 6-8% of the D-B price. QA should be roughly 4%. That is why the TCA's contracts include a provision that allows the owner to shut down the contractor if they don't have sufficient staffing levels in the QC department.

- UDOT Legacy Parkway: Contractor is responsible for all quality control. The designer-builder's Independent Quality Firm (IQF) is responsible for QA activities with QA oversight by UDOT. Of special note, the IQF Managers report day-to-day to the designer-builder's project manager, but also have direct access to the designer-builder's senior management and to UDOT's project director, as well as directly providing them weekly reports. Some quality issues with construction have occurred. Quality summit meetings were held with all UDOT/FAK(designer-builder) personnel and jointly resolved the issues.
- UTA: The contractor supplied both QA and QC. The QA reported directly to the joint venture's management. A quality plan was developed by the contractor and approved by the owner. The owner then audited compliance with the quality plan in the areas of design, construction, and public involvement. Several issues arose in construction quality. Generally these were observed by the contractor and corrected without comment. When identified and noticed by the owner, the corrections occurred without issue. Construction QA, including QA sampling and testing, was conducted by an independent firm retained by the contractor. One of the project stakeholders (UDOT) performed verification sampling and testing and independent assurance functions for UTA.

3.5.4 Partnering and Disputes

Several agencies mentioned partnering as the solution to different types of problems. Many agencies include partnering as the first step in resolution of disputes. UDOT pointed out the importance of holding a Quality Summit and using partnering to resolve issues as they arise.

Some respondents have created Dispute Review Boards (DRBs) to assist in resolution of disputes where partnering has failed. DRBs are more commonly found on larger, more complex projects. For a few projects the DRB is given binding authority to decide smaller disputes (in which case the documents usually provide that the DRB chairman must be an attorney). However, in most cases DRB's are advisory only.

Six out of 13 agencies did not escrow pricing documents from design-build teams.

The seven agencies that used escrowed pricing documents, on the other hand, believed they were valuable. ACTA said: "Proposal documents were delivered into escrow on the Proposal Due Date. Prior to award ACTA representatives reviewed the selected proposer's documents to determine whether they were complete. Following award the documents were delivered to ACTA to be held in a locked file cabinet (with the key held by the Contractor). The documents have been helpful re: disputes regarding scope, pricing of work. They help to discourage unjustified claims. For future contracts, we would want to require pricing data for major subcontracts, and conduct a preliminary review as the pricing data are provided, similar to the pre-award review of the contractor's data described above."

TCA described its process as follows: “The documents were initially delivered to an escrow company and following award were kept in a locked file cabinet in a locked room in the Agency’s offices. They were reviewed on multiple occasions for both the San Joaquin and Eastern contracts, for the purpose of determining whether certain items were included in the original bid and for the purpose of determining a reasonable price for added or deleted work. For San Joaquin, on two occasions a review of the escrowed documents resulted in a determination that the contractor had provided for the work in question in bidding the job.”

On the topic of disputes involving third parties, ACTA said: “We would want to consider ways to avoid disputes regarding compliance with third party agreements. The contract documents included agreements with local agencies serving to establish the procedure to be followed by the contractor in design and construction of improvements that would be owned by the local agencies. Provisions in these agreements were interpreted differently by the contractor and the local agencies (such as the meaning of the phrase “in substantial accordance with”). We might want to include a provision regarding the philosophy underlying the contractor’s dealings with third parties — requiring the contractor to satisfy the agency’s requirements, and limiting the contractor’s recourse if it disagreed with the agency.”

3.6 Payment

3.6.1 Contract Price

Almost all of the agencies surveyed use fixed price contracts. A number of contracts include allowances for specific items, or provide for certain work to be paid on a unit priced basis. Greenville County is the exception, using unit-priced contracts subject to a not-to-exceed fixed amount. Typically, payments are based on monthly progress and are tied to the CPM schedule for the project, although one agency (UTA) pays based on achievement of milestones in predetermined “price centers”.

3.6.2 Contingency

Two of the projects included a contingency amount that was specifically made available to the contractor for certain types of changes. The Atlantic City/Brigantine Connector had a \$28 million contingency pool that was available to pay for many different types of costs incurred by the contractor — which had a powerful incentive to avoid incurring such expenses since it was entitled to a significant share of any amounts remaining in the fund at the end of the job. UTA’s contract included a similar concept (“Provisional Sum” for dry utilities – defined by the contract as all utilities except water, sanitary sewer and storm sewer), but with a much smaller contingency.

3.6.3 Mobilization

Most of the agencies surveyed pay for mobilization. The amount payable varies from project to project, as does the time of payment. In some cases mobilization is spread into multiple payments as different work efforts commence. The overriding concern is to avoid “too much front end loading”.

3.6.4 Retainage

Retainage policies vary from one agency to another. The differences appear to be based more on the agency's policies, or state law, than on any particular concerns relating to design-build. Two of the agencies, Greenville County and ODOT, do not withhold any retainage.

3.6.5 Incentive Payments

Incentive fees (including award fees — a type of incentive fee paid on a periodic basis throughout the project, not just at the end) are payments to the contractor in addition to the contract price for performance that exceeds predetermined levels of performance that are set in the contract requirements. The criteria are usually established for performance above expected contract compliance requirements.

A number of agencies provided incentive payments for early completion, including the TCA, UDOT and UTA. UDOT and UTA also provided award fee payments at 3-month intervals throughout their projects for progress exceeding that shown on the contract schedules.

In addition to schedule incentives, several agencies, including ADOT, FDOT, UDOT, and UTA, implemented award fee programs that provided for periodic, supplemental payments to contractors during the course of projects for performance in other areas of work that the agencies judged to exceed contract requirements. The intent of the award fees was to encourage superior performance in areas of greatest interest or concern to the agencies. UDOT had award fees related to quality, project management, maintenance of traffic and access (MOTA), and community relations. UTA had a significant award fee program related to MOTA and community relations where community representatives rated the contractor's performance and recommended the amount of award fee payment to the agency. ADOT instituted an award fee to reward the contractor for providing public travel through the project at a rate in excess of minimum requirements, with the performance measured by an intelligent transportation system designed and implemented by the contractor.

3.6.6 Limitation on Payment

For projects extending over several years, some agencies have evaluated the proposed contract price using a present value calculation. In order to determine the present value, the proposal must include information regarding the projected cash flow. That cash flow is then the basis for a "maximum payment curve" that limits the total amount payable to the contractor at any point in time. Some agencies will agree to pay for accelerated work notwithstanding the payment curve; others require the contractor to reimburse the additional interest expense associated with accelerated payment.

3.7 Schedule

3.7.1 Establishing Completion Deadlines

The first question addressing schedule issues requested information regarding how contract completion dates were set and how schedules were used in the evaluation and selection process.

Most agencies set the completion dates or contract times in their RFP documents. However, schedule information was solicited and used as part of the evaluation and selection process.

Table 3.7.1
Approach to Establishing Completion Date(s)

Agency/ Project	Set in RFP	Established in Proposals and Evaluated	A+B Bidding
AC/BC	X		
ACTA	X		
ADOT	X		Maximum contract days allowable given in RFP but shortened by Contractor through A+B pricing
CDOT		X	
FDOT		X	X
FHWA	No response to question		
Greenville Co.	X		
NAVFAC	X	X	
ODOT	X		
TCA	X		
UDOT	X	X	
UTA	X	X	
WSDOT		X	

3.7.2 Early Completion Incentives, Liquidated Damages, Stipulated Damages

Almost all agencies provided for liquidated damages (LDs) and/or stipulated damages (SDs). Early completion incentives were not uncommon, but not universally provided.

Typically the amount (rate) of LDs and SDs were determined using standard agency formulas. For toll road projects, the rate was based on estimated loss of toll revenues.

The amount of incentive for early completion was directly tied to toll revenues in the case of toll road projects (for example, 70% of net revenue for period up to contractual completion date). For non-toll projects, the amount was generally established based on the importance of early completion.

Some projects provided incentives payable throughout the project (not just at final completion) for on-schedule (or better) performance at predetermined intervals during the project.

Table 3.7.2
Approach to Incentive Fees, LDs and SDs

Agency/ Project	Early Completion Incentive	LDs/SDs
AC/BC	No	Loss of toll revenue
ACTA	No	Yes, based on lost revenue
ADOT	No	Yes; based on road user costs
CDOT	No; but contract allows CDOT to institute incentives during course of contract	Yes
FDOT	Based on user costs, business impacts & inspection costs	Standard formula
FHWA	No response to question	
Greenville Co.	No	No
NAVFAC	No	Based on impacts of late delivery
ODOT	Yes	User costs
TCA	70% of net toll revenue	Varied; \$10k-\$144k per day
UDOT	Yes	Yes; standard formula modified for different areas of project
UTA	Yes	Yes
WSDOT	No	Yes; standard formula

3.7.3 Required Schedule Submittals and Remedies Available for Failure to Submit Schedules

Most agencies required submittal of schedules with the proposal, which was used during the evaluation and selection process. All required schedules during the contract,

although the frequency of updates varied. The most common remedy available for failure to submit required schedules/updates was suspension of payment (rarely used).

Some agencies required varying levels of detail for schedule submittal with the proposals and after award. Generally preliminary schedules were required at proposal and early in the project, with more detail required as the work progressed.

Table 3.7.3
Approach to Schedule Submittals

Agency/ Project	Required in Proposal	Required After Award	Frequency of Updates	Remedy
AC/BC	Yes	Yes	Monthly with payment request	No response
ACTA	Yes	Yes	With payment request	No response
ADOT	No response to this question			
CDOT	Yes	Yes	Very detailed schedule requirements in contract & with payment request	Suspension of payment
FDOT	Yes	Yes		Suspend payment; not used
FHWA	No response to question			
Greenville Co.	Yes	Yes	No response	No response
NAVFAC	Yes	Yes	Varies by project	
ODOT	No	Preliminary @ pre-design mtg. Detailed @ preconstruction meeting	Monthly	Suspension of payment
TCA	Preliminary	Split for NTP1 and NTP2 (cost- loaded)	6 months	Suspend payment; used once
UDOT	Preliminary	Yes	Monthly	Suspend payment; not used
UTA	Preliminary	Preliminary by NTP+30; detailed by NTP + 90	Monthly	Suspend payment on price component that included schedule; not used.
WSDOT	Yes	Yes	No response	No response

3.7.4 Schedule Float

The survey question addressed “ownership” of float. Agencies had a variety of approaches from “Project Float” (at times referred to as “first come, first served”); to Contractor-owned, or owned by the entity that generated the float. There were indications that the latter approach was difficult to measure and administer. The preference seemed to be the “Project Float” approach.

**Table 3.7.4
Approach to Float**

Agency/Project	Project Float	Contractor-Owned	Owned by Entity Generating Float	Variable, Depending on Situation
AC/BC				X
ACTA			X	
ADOT	Not considered			
CDOT	X			
FDOT	X			
FHWA	No response to question			
Greenville Co.		X		
NAVFAC		X		
ODOT	X			
TCA			X	
UDOT	X			
UTA			X	
WSDOT	X			

3.7.5 Recovery Schedule

The fifth schedule question solicited information regarding requirements for Recovery Schedules and the triggers for same.

Most agencies required a recovery schedule if progress fell behind a specified amount. The actual triggers varied, but there were close similarities among five agencies because their contract provisions were based on a similar model.

Table 3.7.5
Approach to Recovery Schedules

Agency	Recovery Schedule Required	“Trigger”
AC/BC	Yes	Greater of 10 days or 2% of remaining time
ACTA	Yes	Greater of 10 days or 2% of remaining time
ADOT	N/A; project always ahead of schedule	
CDOT	Yes	Baseline schedule evaluated and revised at 3mos. & 6 mos. intervals to hold contract completion deadlines.
FDOT	Yes	No specific response provided
FHWA	No response to question	
Greenville Co.	No	N/A
NAVFAC	N/A	N/A
ODOT	Yes	If 15 days behind schedule
TCA	Yes	Greater of 10 days or 2% of remaining time
UDOT	Yes	Greater of 10 days or 2% of remaining time
UTA	Yes	Greater of 10 days or 2% of remaining time
WSDOT	N/A	N/A

3.7.6 Recommended Changes for Future Projects

Only three agencies made recommendations for changes in how schedule issues were addressed:

ADOT recommended use of A+B bidding that allows contractor to drive schedule.

TCA recommended that float be Project Float rather than owned by entity generating it.

WSDOT recommended that the contractor be allowed to set start and completion dates in proposals with the thought that this approach might reduce impact of construction on the public.

3.8 Right of Way/Utilities

3.8.1 Right-of-Way

The agencies were asked to identify their right-of-way (ROW) acquisition needs for the projects. In some cases (ADOT) the agency is required by law to have all right-of-way in hand prior to issuance of a procurement package, or has made a policy decision to obtain all right-of-way in advance of issuance of the RFP or award (FDOT, ODOT, WSDOT). However, many of the agencies still had some parcels to acquire following award of the design-build contract. Some of those agencies established the ROW boundaries and advised the designer-builder when the parcels would be available. CDOT had less than 20% of the ROW prior to the RFP, and about 35% at the proposal date. Some agencies required the designer-builder to participate in the ROW acquisition process, providing surveys, property descriptions, title binders, appraisals, etc.

For the I-15 project, UDOT established a project ROW team outside the normal UDOT ROW acquisition staff to facilitate acquisition of the over 160 parcels required for the project, and obtained a waiver of FHWA's requirement to certify ROW prior to proceeding with construction. Appraisals and negotiations were initiated prior to approval of environmental documents, with acquisition starting subsequent to receiving approvals of those documents. None of the ROW was acquired before issuing the RFP or awarding the contract. A ROW acquisition schedule was included in the RFP with a commitment by UDOT as to the availability of the individual parcels (i.e., UDOT assumed the risk for the availability of parcels). Proposers were given the opportunity to identify their priorities for ROW acquisition. After award, UDOT and the contractor continued to adjust priorities, work schedules and ROW acquisitions to meet the contractor's needs and UDOT's ability to provide needed parcels. There were no impacts on the project schedule as a result of ROW acquisitions.

3.8.2 Utilities

Utility relocations are traditionally a major issue for transportation projects, and as noted by the surveys, are likely to present significant problems for design-build projects. With regard to the Alameda Corridor, ACTA said: "One of the major concerns raised by the contractors proposing on the project included utility relocation requirements (the project involves 20 utility owners and over 500 relocations) and other third party requirements (a significant portion of the project is outside of the two cities that are members of the Authority, crossing the jurisdictions of several other cities). The I-15 project had even more conflicts, with 1,500 utility crossings, 600 potential conflicts/relocations and 40 different utility owners. Both UDOT and ACTA went to great efforts to reduce the utility risk and to clearly allocate responsibilities for different tasks relating to utility relocations. For both projects, these efforts succeeded in avoiding adverse impacts to the project schedule.

A number of the survey questions concerned utility relocations:

Unidentified Utilities: Since utility risk is often the subject of complicated contract provisions dealing with matters such as payment for unidentified or misidentified utilities, one question concerned the line drawn between facilities that are considered utilities and facilities that are not, and another question asked about steps taken to reduce the risk of unidentified facilities.

The contract provisions for a number of projects (including TCA) specifically provided that “Storm drains, traffic signals, street lights, and electrical systems for roadways are part of the Contractor’s scope and are not considered to be utilities.” The TCA’s documents also distinguish between defined “main or trunkline” utilities (for which additional compensation will be allowed if a facility was not identified or if there were material errors in the survey) and facilities that are the designer-builder’s responsibility.

Almost all of the agencies indicated that they had conducted utility surveys for inclusion in the RFP. For the I-15 project, as part of the preliminary engineering during the preparation of the RFP, UDOT identified and mapped existing utilities in great detail through early, close, continuous coordination with all utility companies. WSDOT says “utilities were identified by WSDOT prior to the RFP. The information was shared with the design-build teams. This meant WSDOT had the responsibility for location of utilities.”

Master Agreements: The survey also asked whether agencies had entered into master utility agreements, another means of mitigating the risks associated with relocations.

For the I-15 project, UDOT executed Master Agreements (that included the utilities’ design criteria and construction specifications) with all utility owners and the inclusion of the agreements in the RFP (or drafts where agreements were not finalized). Similarly, for the Alameda Corridor, the Authority “addressed the utility and third party concerns by negotiating agreements with utility owners and local agencies, and included comprehensive provisions in the contract documents addressing different situations that were likely to arise. Several of these agreements were finalized post-proposal and were incorporated into the contract by an addendum and supplemental proposal prior to award. A change order would have been issued to the extent that subsequent agreements resulted in a change in the contractor’s work.”

FDOT stated that “[a]s a standard practice, we have master utility agreements with all major utility companies.” ODOT also negotiates all utility master agreements prior to award.

Work Allocation: It is also possible to reduce risks associated with utility relocations by arranging for the designer-builder to perform the relocation work. UDOT aggressively negotiated with utility owners to allow the designer-builder the right to design and construct relocations. Of the over 40 utility owners involved, all but one agreed to have the contractor design and construct relocations that placed the contractor in control of this critical work (and more importantly, all aspects of the project

schedule) and eliminated one of the major risk factors from the project -- utility-caused delays.

Payment Responsibility: Another issue mentioned by certain of the agencies surveyed was the question of payment responsibility. UDOT paid for the relocations under the contract, and issues of reimbursement were handled off-line between UDOT and the utilities.

For the Greenville County program, the designer-builder assumed close to full responsibility for interface with utility owners and performance of utility work. The TCA also delegated significant payment responsibility to its contractor.

Force Account Approach: UTA stated that the contract requirement to pay for dry utility work on a force account basis within an allowance was overly burdensome. (This approach was driven by the fact that the scope of the work could not be ascertained prior to contract award.) UTA said that it would prefer to obtain unit prices if the situation arose again.

3.9 Risk Allocation

Most of the agencies interviewed had implemented a systematic process for identification and allocation of risks, and advocated use of such a process by any agency as an integral part of the design-build process.

ACTA: Conducted workshops to identify risk, determine high risk items, examine approaches to mitigate risks, and allocate risks among parties including the project owner, contractor, and insurers, and then reconsidered its decisions during the industry review process

FDOT: "Districts use a team of professionals to develop the RFP. Part of this process includes the District looking at the individual project and making decisions as to how the Department can minimize risks for us and the contractor, and ultimately, spelling out who has what responsibility."

NAVFAC: "NAVFAC uses a Functional Analysis Concept Development (FACD) procedure for all projects at the beginning of the design phase to identify potential problems and reduce risk. FACD combines system design and costing with value engineering methodology in an architectural charrette format (workshops where various design solutions are discussed). It is a concentrated study that employs an iterative and interactive process utilizing a wide variety of tools (e.g., studies, ad hoc workshops, focus groups, brainstorming, cost modeling, value analysis, mind mapping, role playing, etc.)"

TCA: Numerous discussions regarding risk allocation in determining contract terms, risk allocation decisions re-examined during industry discussions.

UDOT: Conducted workshops. For I-15, the UDOT RFP conducted a process of risk identification, risk assessment, risk allocation (UDOT or designer-builder), and risk

mitigation measures. It was during this process that the risk mitigation approaches to ROW and utilities were developed.

UTA: Used partnering sessions to identify risk and mitigation plans.

WSDOT: Conducted workshops.

WSDOT: “During the initial scoping of a project a risk allocation matrix is laid out. In reviewing the risk allocated to the owner (WSDOT) the decision is made how far the initial design must be taken to satisfactorily address these risks. Should the time required to address the risk extend beyond the time required to fully design the project then the decision would be made to utilize design-bid-build.”

3.10 Change Orders

Many agencies maintain generally the same process for change orders for design-build contracts as for non-design-build contracts. There is, of course, one significant difference, namely that design personnel will probably be involved in implementing the change and will need to be appropriately compensated. A number of agencies have established pre-set markups for force account work. Other agencies rely on a negotiation process to determine appropriate compensation for changed work.

3.11 Warranties/Maintenance

The survey asked for information regarding use of warranties and post-completion maintenance by designers-builders.

Design-build contracts often include general warranties as well as specific warranties, although FHWA’s recently proposed rule on design-build might preclude use of general warranties. The general warranty provides the owner with a backstop for the eventuality that it failed to spot defective work when it inspected the project for acceptance purposes. If the contractor is the entity responsible for quality assurance and quality control, use of a warranty and/or long-term maintenance is a critical element in satisfying the owner that it will obtain a quality product. Warranty terms for the surveyed projects ranged from one to five years.

Only one of the entities surveyed had entered into a design-build-maintain contract (UDOT) — the I-15 contract included maintenance options for up to ten years. However, UDOT did not exercise the maintenance option.

3.12 Subcontractors/DBE/EEO/Key Personnel

The survey asked for information regarding subcontracts, disadvantaged business enterprises, equal employment opportunity, and key personnel.

The respondents did not provide a significant amount of information regarding subcontracting. Several noted minimum levels of work that were required to be

performed by the designer-builder, and one noted a minimum amount of work that was required to be subcontracted out.

With regard to DBE programs, the respondents noted that the primary difference between their standard program and their design-build program was the fact that DBE participants were not necessarily identified in the proposal.

No major concerns were raised regarding EEO requirements.

Several agencies, however, indicated concern regarding key personnel leaving the project.

3.13 Insurance/Bonds/Indemnities/Limit on Liability

3.13.1 Insurance

Several agencies have implemented Owner Controlled Insurance Programs (OCIPs), including ACTA, ADOT, TCA, UDOT, and UTA. Some OCIPs included errors and omissions coverage. ACTA purchased an owner's protective errors and omissions policy. UTA required the contractor to provide errors and omissions coverage. One of the agencies that has used OCIPs (ADOT) intends to require the contractor to provide insurance in the future.

The invitation for bids for the Atlantic City/Brigantine Connector asked the proposers to bid both with and without an OCIP. Upon review of the bids, a determination was made that it would be more cost-effective for the contractor to provide the insurance.

CDOT is using a partner-controlled insurance program.

3.13.2 Bonds

Many agencies require 100% payment and performance bonds, including the Atlantic City/Brigantine Connector, Greenville County, NAVFAC, ODOT and UTA.

For larger projects, agencies are often willing to accept reduced bond amounts, with the amount based on the potential cost overruns resulting from a "worst case" scenario. The bonds for the ACTA, CDOT, TCA, and UDOT projects were in the amount of \$250 million. For the Legacy Parkway project UDOT agreed to accept a performance bond in the amount of 50% of the contract price, and a \$170 million payment bond.

The decision to accept a reduced amount is based in part on the surety industry's reluctance to issue 100% bonds for mega-projects, and in part on the fact that only a handful of contractors have sufficient bonding capacity to provide such bonds. Requiring a 100% bond would therefore be likely to reduce the pool of interested contractors and could therefore have a significant impact on the contract price.

3.13.3 Limitations on Contractor Liability

A number of the agencies surveyed provided for limitations on the contractor's liability. The limitation can be in the form of a dollar cap on liability, in the form of an absolute waiver of the right to consequential damages, or in the form of a provision stating that a particular remedy (such as warranty) is exclusive. There are many variations for such provisions.

4.0 Analysis of Responses

4.1 Reasons for Using Design-Build

All of the agencies surveyed cited accelerated project delivery as a major factor in the decision to use design-build. Schedule acceleration is possible due to a number of factors, including (a) the ability to start construction work before the design is 100% complete, (b) input by construction personnel into the design process (allowing the designer to incorporate the constructor's innovative ideas, skills, equipment, etc., into the design, thus expediting the construction process), and (c) use of a single procurement process for selection of both the designer and the constructor.

Cost certainty was listed as a major factor by many of the agencies surveyed. Perhaps the most significant reason why design-build results in greater cost certainty is that it involves a single point of responsibility for both design and construction. Designer-builder claims against project owners, based on design defects, are eliminated. Many agencies transfer additional risks and responsibilities to designers-builders in order to further reduce the opportunity for claims and enhance cost certainty. This approach could result in a higher overall project cost since the designers-builders will include a contingency in the proposal price to account for the increased risk. The designer-builder would be paid the full contract price even if the risk fails to materialize. This approach is commonly used for project revenue-financed projects such as toll roads, where the need for cost certainty is intertwined with the plan of finance and is therefore worth the potential additional cost.

Several agencies stated that they believed design-build resulted in reduced costs. This appears more likely to occur where the designer-builder is allowed significant design flexibility; for example, where performance specifications are used.

Innovation and improved project quality were cited by a number of agencies as reasons for using design-build. Innovation can be encouraged in many different ways, including use of performance specifications and/or asking proposers to submit alternative technical concepts in their proposals. Improved project quality can be encouraged through use of a best value selection process that considers project enhancements included in the proposal as well as evaluating qualifications of the key personnel and the designer-builder's past performance. Many noted that design-build project quality is equal to or better than the quality of projects delivered using design-bid-build.

One agency (ADOT) stated that one reason it used design-build was to obtain private grant money for property access improvements. In addition, designers-builders may, in some cases, be asked to obtain financing for the project (this was the case for the Massachusetts Highway Department's Route 3 North Reconstruction Project), or to agree to allow a portion of the payments owing to be deferred until the agency has cash flow allowing payment to be made (this is often part of the plan of finance for project revenue-financed projects).

Several agencies pointed out that they have been able to accomplish more work without any need to increase staffing.

One agency stated that design-build has resulted in improved relations with its contractors.

4.2 Stated Successes (or Failures)

All of the agencies responding to the survey believed that their design-build programs/projects were successful. This is not surprising, given the criteria for selecting the interviewees. No failures were noted, although many of the agencies offered suggestions for improvement and stated that they planned to consider lessons learned in connection with future projects. This was particularly evident when discussing QA/QC with the agencies (see Sections 3.5.3 and 4.7).

4.3 Use of Modified Design-Build, Pure Design-Build and Other Design-Build Variations

Table 4.3 identifies the different agencies participating in the survey, listing them in groupings depending on the level of design flexibility allowed for their projects.

The first grouping includes agencies that performed a relatively high level of design work prior to award of the design-build contract, awarding the contract to the low bidder meeting specified pass/fail qualifications. (FHWA refers to such a process as "modified design-build".) Although these projects allow some design flexibility, many of the design concepts are fixed before the designer-builder is selected, and it would be necessary to obtain specific owner approval of any deviations (for example through a change order or value engineering process). This approach often results in duplicative design work, since the designer-builder may decide to ignore certain of the concepts included in the owner's design.

The second grouping includes projects that allowed the designer-builder significantly more leeway in design than the first grouping. This flexibility is enabled through a pre-proposal technical concept review process, and a combination of performance and prescriptive specifications.

The third grouping includes a single agency (NAVFAC) that uses a best value selection process with performance specifications (for the most part). Although this approach allows greater design flexibility than the prior groupings, it allows somewhat less flexibility than the private sector approach. In this regard, the NAVFAC survey noted

that it typically completes its NEPA analysis prior to issuance of the procurement package, thus limiting the options available to the designer-builder.

The final grouping includes two agencies (TCA and Greenville County) that selected their design-build contractors very early in the design process (for TCA this occurred following conceptual design, prior to final NEPA approval), thus allowing maximum flexibility in design.

Table 4.3
Grouping of Agencies by Level of Design Flexibility
in Design-Build Project

	Agency	Project	Procurement Process	Type of Specifications	Comments
Group One	San Joaquin Hills Transportation Corridor Agency	San Joaquin Hills Toll Road	Low present value	Prescriptive	
	Foothill/ Eastern Transportation Corridor Agency	Eastern Toll Road	Low present value	Prescriptive	IFB provided for possibility of BAFO's
	ODOT	Various	Low bid	Prescriptive	New legislation allows best value selection
	Atlandia Design & Furnishings, Inc., NJDOT, South Jersey Toll Authority	Atlantic City/ Brigantine Connector	Low Bid	Combination performance (tunnel operations, bridge concrete) and prescriptive	
Group Two	Alameda Corridor Transportation Authority	Mid-Corridor Design-Build Project	Lowest ultimate cost, limited negotiations	Combination of performance and prescriptive	Proposal could include pre-approved alternative technical concepts
	San Joaquin Hills Transportation Corridor Agency	Glenwood Pacific Interchange	Fixed price, best proposal	Prescriptive	Proposal could include pre-approved alternative technical concepts
	ADOT	Various	Best value (formula)	Combination of performance and prescriptive	No alternative technical concepts
	Utah Transit Authority	University Line	Best value (adjectival converted to formula); negotiations	Combination of performance (street pavement sections) and prescriptive	

Table 4.3, cont'd
Grouping of Agencies by Level of Design Flexibility in Design-Build Project

	Agency	Project	Procurement Process	Type of Specifications	Comments
Group Two, cont'd	FDOT	Various	Best value (formula)	Require Firms to use AASHTO criteria in most cases but also provide outcomes desired. In other words we do not dictate bridge type but do dictate that AASHTO and Florida Standards be used.	
	UDOT	I-15	Best value (adjectival)	Combination of performance and prescriptive	
	UDOT	Legacy Parkway	Best value (formula) (choosing by advantages)	Combination of performance and prescriptive	
	CDOT	T-REX	Best value (adjectival); upset price	Combination of performance and prescriptive; alternative technical concepts incorporated into proposal	
Group Three	NAVFAC	Various	Best value (adjectival)	Performance specs "for the most part"	
Group Four	Foothill/Eastern Transportation Corridor Agency	Foothill-South	Best value (formula) for proposals with prices within 5% of low price	Combination of performance and prescriptive	Designer-builder selected to perform preliminary design; price set for final design and construction upon completion of preliminary design
	Greenville County	Various	Negotiations with proposer selected based on review of technical proposals	Combination of performance and prescriptive	RFP/Contract includes a fixed, stipulated sum price

4.4 Commonly Used Practices Relating to Design-Build Procurements

4.4.1 Systematic Risk Allocation

Although some agencies have not undertaken a systematic approach to risk allocation, the seven agencies (ACTA, FDOT, NAVFAC, TCA, UDOT, UTA & WSDOT) that have done so advocate it wholeheartedly.

4.4.2 Industry Review Process

Regardless of the procurement methodology used, most agencies recommend one-on-one meetings with the shortlisted firms prior to issuance of the RFP, to obtain the benefit of their thoughts on the draft documents. Industry review meetings can be particularly productive if the industry review package includes a term sheet showing the major contractual terms and conditions, as well as information regarding the approach to risk allocation, in addition to providing technical information for industry review.

4.4.3 Procurement Process

Although a two-step process provides less flexibility to both the owner and designer-builder than a pure Qualifications-Based Selection (QBS) (where the selection is based on qualifications only, with costs not a factor) process, it is perceived as more open and competitive because price is usually a major factor in the selection. A two-step process is more likely to be accepted by state legislators and is less likely to engender industry opposition than a process that would allow design-build contracts to be negotiated with the most qualified firm. Note also that FHWA's proposed design-build rules for federal-aid projects currently would not permit a QBS selection process. As a general matter, despite the reduced flexibility inherent in a two-step process, agencies using such a process gain benefits from both innovation and competition. Enhanced competition is likely to result because the private sector is generally more willing to participate in a procurement where the selection process is well defined. One of the key advantages to this methodology is marketplace familiarity with the process, allowing teams to develop standardized responses, thus reducing the cost of competing.

The two-step process often involves one-on-one communications with proposers during the post-RFP/pre-proposal period. This allows proposers to speak freely regarding technical concepts that they do not want their competitors to know about. However, an agency using this process should establish procedures to ensure that any information disclosed to one proposer is disclosed to all of them, and otherwise take precautions to avoid protest situations. A two-step, best value process may also include post-proposal discussions, allowing the agency to advise the proposer regarding areas of its proposal that require improvement.

There are many possible ways to determine best value. The criteria used in making the determination, and the methods used to make the selection decision, vary significantly from project to project. It should be noted that FHWA's proposed design-build rule would require that price be weighted at least equal to 50%.

4.4.4 Stipends

Stipends are commonly, although not universally, part of the procurement process. Often the funds will go directly to the design members of the team. There is a perception that stipends result in better proposals and are well worth the money spent. Even if the proposals do not produce useful ideas, the stipend encourages proposers to “stay in the game”, thereby enhancing the price competition. Nevertheless, in many jurisdictions stipends are politically controversial.

Agencies that have used stipends include ADOT, CDOT, FDOT, UDOT, UTA and WSDOT. ACTA and the TCAs were not willing to seek special authorization to pay stipends, and instead provided for unsuccessful proposers to receive compensation for any ideas they provided that are in fact later used by the selected designer-builder.

4.5 Commonly Used Design-Build Contract Concepts

4.5.1 Basic Configuration

A number of agencies include a basic configuration concept in the contract, for the purpose of constraining the designer-builder’s ability to deviate from a particular design and also to provide for payment to be made to the designer-builder if the assumed configuration that was the basis for its price estimate proves to be impossible to build.

4.5.2 Escrowed Pricing Documents

A number of agencies have required contractors to escrow their pricing documents to be available under specified circumstances, often limited to disputes but for some projects extending to matters such as negotiation of change orders. For such contracts, and where the documents are held in the agency’s offices instead of an off-site location, the agencies believe that access to the pricing data has been helpful.

4.5.3 Design Review Process/Release for Construction

There is no consensus regarding the appropriate level of design reviews or design requirements to be met before the designer-builder is allowed to start construction. Approaches range from FDOT’s oversight of the design for compliance with AASHTO standards, without any review of details, on occasion allowing construction to proceed without plans, to UDOT’s “over-the-shoulder” participation of the design reviews conducted by the designer-builder, to the detailed design reviews required for the TCA projects, including specific approvals associated with release for construction.

It appears that one of the reasons for avoiding design reviews, or avoiding design approval, is a desire to avoid liability. FDOT states: “No such thing as 30-60-90 stages. Review various components when available. No formal approval – to avoid liability. Just notify if we see problems.”

By contrast, in some states, design approvals may be required in order to avoid liability to third parties for design defects. For example, in California, public agencies are

entitled to sovereign immunity for design defects resulting in dangerous conditions of public property only if the design was approved by a public employee with discretion (or by the governing board of the agency).

4.5.4 Risk Allocation

The approach to risk allocation taken by an agency depends in large part on its project goals. Where cost certainty is one of the most important goals, the agency may decide that it is cost-effective to transfer risk to the designer-builder even though it knows it will have to pay for that risk. Where schedule is paramount, a similar analysis applies.

The risk allocation process discussed in Section 3.9 above usually starts with identification of risks, categorizing the probability of occurrence and determining how significant the impact would be if the risk occurred. Risks that are generally perceived as the most problematic for transportation project include right-of-way, utilities, differing site conditions, hazardous materials and force majeure events. Once risks are identified and categorized, the owner will focus its attention on the high probability, high impact risks, addressing possibilities to reduce the likelihood of the occurrence and deciding how to allocate risks between the parties (or how to share the risk with third parties).

Agencies developing toll and other revenue-financed projects typically take a much more aggressive approach in transferring risk than agencies developing projects based on their overall program. As an example, while agencies such as ADOT, UDOT and UTA allowed time extensions for force majeure events affecting the critical path, agencies such as the TCA and ACTA allowed time extensions only for specifically listed force majeure events (major items such as major earthquakes and injunctions). The decision to allow only limited time extensions was influenced by the capitalized interest requirements that would have otherwise been placed on the project, as well as a belief that, even though the designer-builder cannot control the original occurrence, it has the ability to control how the impacts of the event are managed.

Some agencies allow price increases for changes in the scope of work caused by force majeure events—based on the premise that they would like the contractor to bid solely on the work described and the fact that under a “traditional” contract matters such as changes in law affecting the project design would require a change order. Some agencies do not allow price increases for such changes, limiting the relief allowed to time extensions. At least one agency would limit payments for any changed work to direct costs, without markup. Some agencies have agreed to assume liability for delay damages due to force majeure events such as injunctions against the project. This approach is likely to be requested by the proposers if they perceive that the project is likely to be challenged in court.

To a certain extent, decisions regarding risk are driven by the desire to give the contractor maximum flexibility. The project schedule, budget and matters such as public impacts also impact the decision-making process. Right-of-way and utility risk can be eliminated by early acquisition and clearing of the right-of-way, but for some

projects, the completion schedule and/or budget may not permit early work. In addition, project owners may prefer to have the contractor involved in the right-of-way acquisition process, in order to allow the contractor maximum flexibility regarding alignment. Utility work may be included in the contractor's scope in part because of the contractor's ability to "design around" utility conflicts, as well as the fact that the relocation work will cause less disruption to the traveling public if it is coordinated with the project construction.

"Traditional" construction contractors have significant concerns regarding attempts to transfer liability for differing site conditions to them. Contractors generally take the position that it is more cost effective for project owners to retain the risk of differing site conditions rather than pay a risk premium to their contractors. For non-design-build federal-aid highway projects, Congress adopted this concept wholesale, and has specifically required agencies to assume site conditions risk. However, for design-build projects site conditions issues can be problematic, due to the designer-builder's control over the project design. As a result, it may not be in the project owner's best interest to assume this risk. However, it is always advisable for owners to take steps to reduce the risk of unforeseen conditions, including performing geotechnical surveys, provide the results to the proposers, and allowing the designer-builder to rely on the survey results to a certain extent. In some cases, the designer-builder will be allowed a price increase and/or time extension if the actual site conditions differ from those reasonably assumed by the designer-builder based on the data provided. In other cases the designer-builder will be given relief only if they can establish that the boring data was incorrect, leading to incorrect conclusions regarding the actual conditions. In some cases the contractor is entitled to a price increase only for major problems (for example, for the Alameda Corridor the contractor was entitled to a price increase only if differing site conditions resulted in cost increases greater than \$10 million. In other cases the contractor must look to a specific pot of money (a contingency pool) for compensation, and following exhaustion of that pool of funds cannot receive additional relief.

Hazardous materials remediation is another issue of major concern to the contracting industry. Where the risk is low, owners usually allow a price increase based on time and materials records, or unit prices included in the proposal. Solutions for higher risk projects include extensive specifications regarding management of remediation work, including the obligation to show that the work was necessary and could not have been avoided or mitigated. For the case of the Alameda Corridor the owner limited the contractor's price increase for unplanned remediation work to 90% of costs, without markup, in order to give the contractor an incentive to manage the work properly. (This approach did not produce the desired result, and the agency now believes that the contractor should bear a higher share of the remediation cost.)

4.5.5 Cap on Liability

Most "traditional" public works contracts do not include limitations on the contractor's liability. Although limitations on liability are of significant concern to contractors in general, they appear to be more concerned about private projects and less concerned about public projects. This may be due in part to a belief that public agencies are less likely to bring action if a problem occurs, and in part to the fact that the type of damage

that a public agency is likely to incur is significantly different from damages that would be incurred by for-profit operations. Nevertheless, for major projects, particularly those involving toll or other revenues, and particularly where the pool of potential proposers is small, contractors are likely to ask the project owner to include provisions limiting their liability.

4.6 Issues Raised in Surveys

4.6.1 Proposal as Contract Document

Several agencies indicated that they felt it was advisable to include language in the contract clarifying what is meant by including the Proposal as a contract document. From the contractor's perspective, it may be unfair to require it to be bound by commitments made based on a 30% design. On the other hand, if those commitments were the basis for selection of the contractor, it would seem that the contractor ought to be bound by its proposal.

One issue relates to the order of priority of the documents. If the proposal contains commitments that are beneficial to the agency but which arguably conflict with provisions of other contract documents, are those commitments binding on the designer-builder? NAVFAC includes language in its contracts making it clear that it has the right to require the contractor to abide by its commitments, regardless of conflicts.

Another concern relates to the possibility that assumptions made by the contractor in its proposal prove incorrect. The contractor could, in theory, claim that it was entitled to a price increase for changes that must be made to the design concepts in its proposal. Contracts could include general language addressing this concern.

An approach used by some agencies is to go through the proposal carefully, and only incorporate those provisions that the agency wants to include.

4.6.2 Key Personnel and Designers

Some of the agencies indicated that personnel, or design firms, were reassigned from the project prematurely, and would want to include stronger provisions to discourage that from occurring.

4.6.3 100% Design

In deciding to take a portion of the design work to a high level for the purpose of allowing the designer-builder to start construction work immediately upon award, the agency should consider the implications of such a decision. Both UDOT and ACTA provided their contractors with a 100% design for a small portion of the work. This creates an opening for the designer-builder to contend that the 100% design work was defective. ACTA has determined, in retrospect, that it probably would have made more sense to have left those plans at 90% and to give the contractor responsibility for completing them. The reason for developing these plans to 100% was to allow the contractor to start construction immediately. In fact, because of the lag time between

award of the contract and the finance date, the contractor would have been able to take those plans to 100% prior to issuance of a full notice to proceed.

4.6.4 General Advice

FDOT provided the following general recommendations:

- Set clear criteria
- Choose best people to help with process
- Be willing to change from current processes, take risks, back off from hand holding professionals, and focus on outcomes!

4.7 Agency Handling of QA/QC

Almost all the agency responses revealed an understanding that the basic responsibility for quality should rest with the designer-builder, who is also responsible for both the design and the construction. The agencies' biggest challenge appears how best to transfer the responsibility for quality by maintaining a hands off approach, but at the same time ensuring public due diligence. Almost all of the agencies recognized that QC is best realized when placed in the hands of and managed properly by the producer — the designer-builder. However, a more significant difference of opinion was apparent among the agencies over who should be responsible for QA. Although a few agencies view QA as the sole responsibility and purview of the owner, some owners are moving towards placing the QA responsibility in the hands of the designer-builder, while retaining an oversight QA function through monitoring and/or auditing and independent assurance testing. Agencies that have experienced quality problems on projects are retaining QA responsibility. This approach to QA is occurring for a combination of reasons. First, owners are looking for single source responsibility in their designers-builders. Second, the more control the owner retains (i.e., inspection and approval to proceed with work), the more risk for quality and schedule is retained by the owner and the less is transferred to the designer-builder. This is true for QA in both design and construction. Third, owners are no longer able to hire or retain staff or are under pressure to reduce staff. Additionally, as a lesson learned, one of the agencies (ACTA) stated that they would prefer the primary designer to perform the QA and would also like to have the Engineer of Record provide a certificate at the end of the job regarding conformity of construction to the final design.

As has been alluded to in this report both in this section and in Section 3.5.3, the subject of QA/QC elicits considerable discussion and differing opinions and procedures among the agencies using design-build.

4.8 Legal Issues

This section addresses legal issues identified through a review of legal resources including statutes and case summaries, and also discusses information regarding

various design-build projects based on “off-the-record” discussions with individuals involved in those projects.¹

4.8.1 TEA-21 and FHWA’s Proposed Design-Build Rule

Prior to enactment of TEA-21 in 1998, agencies wishing to use federal-aid funds for design-build projects had to obtain special authorization from FHWA, because federal law required incompatible procurement processes to be used for design and construction contracts. TEA-21 revised the federal-aid law to specifically authorize use of design-build, and required FHWA to issue implementing regulations. A proposed rule was issued in late 2001,² and FHWA has indicated that the final rule will be issued in 2002.

Procurement Process: FHWA’s proposed rule would require a procurement process similar to the requirements of the Federal Acquisition Regulation (the “FAR”) applicable to design-build contracting by federal agencies. In general, the FAR provides for a two-step process to be followed in procuring design-build contracts, consisting of a shortlisting phase followed by a request for proposals (and possibly discussions and a request for best and final offers). Award is made to the responsive, responsible proposer offering the best value to the contracting agency.

Most of the public agencies commenting on the proposed rule indicated that they would like it to allow greater flexibility in the procurement process, and requested FHWA to provide guidelines instead of mandatory requirements.

It is not clear whether FHWA’s final rule will impose specific requirements on design-build projects with regard to the procurement process to be followed, or whether it will provide guidelines. In any event, the process described in the draft rule is compatible with the pending legislation that would allow the Department to proceed with a pilot program.

NEPA: FHWA’s proposed rule provides (in Section 635.112) that federal approval of the request for proposals constitutes FHWA project authorization, carrying the same significance as plan, specification, and estimate approval on a design-bid-build Federal-

¹ The case summaries reviewed included Michael Loulakis’s annual publication of “Design-Build Lessons Learned” (commencing with 1995 and ending with 2001), as well as William Wilburn’s article on “Recent Cases on Design-Build” in *The Construction Lawyer* (Winter 2001), p. 12 and John Ralls’ and Owen Shean’s “Hard Hat Case Notes” in the same publication, p. 42.

² The Office of the Federal Register published FHWA’s Notice of Proposed Rule Making for Design-Build Contracting on Friday, October 19, 2001, pages 53288 - 53311. Text or PDF files of the NPRM may be downloaded from the Federal Register web site

http://www.access.gpo.gov/su_docs/fedreg/a011019c.html.

Written comments were due on or before December 18, 2001. FHWA requested that comments be sent through the Document Management System (DMS) at: <http://dmses.dot.gov/submit>, docket no. FHWA-2000-7799.

aid project. Section 636.109 would permit agencies to proceed with pre-qualifications and industry review, but would prohibit issuance of the procurement package until the NEPA process has been concluded.

Most of the public agencies commenting on the proposed rule stated that they would like to be able to issue the RFP prior to obtaining final NEPA approvals. A number of agencies indicated that they would like to have the ability to award design-build contracts prior to receipt of final approvals, based on language in 23 U.S.C. § 112(b)(3)(B). It is not clear what approach will be adopted in the final rule.

Other Issues: FHWA's proposed regulations address many other issues that will need to be taken into account by the Department in developing design-build contracts. For example:

The proposed rule states that warranties must be limited to "a specific product or feature."³ Many design-build projects approved under SEP-14 included a blanket warranty for a limited time period, giving the owner time after completion to discover defects in the work. If a blanket warranty is not permitted by the final rule, the warranty provisions must be carefully drafted to ensure that all potential problem areas are adequately addressed.

The proposed rule would extend to design-build projects the provisions of 23 C.F.R. §637.205(d), requiring verification sampling and testing to be conducted by the owner or its agent.⁴ Although this would appear to preclude agencies from transferring responsibility for verification sampling and testing to a design-build contractor, in fact FHWA has permitted a number of agencies to transfer such responsibility in the past, generally in conjunction with a warranty obligation.⁵

4.8.2 Procurement Issues

Pre-qualification, Shortlisting and Exclusion of Firms: The case summaries reviewed included one case where an engineering firm was excluded from participating on a design-build team for changes to the electrical distribution system at an airbase in Biloxi, Mississippi. (*SSR Engineers, Inc.*, Comp. Gen. No. B-282244 (June 18, 1999).). The Navy's decision to exclude SSR was based on its prior involvement in preparation of a master plan for a portion of the electrical system that was the subject of the procurement. The Comptroller General rejected SSR's arguments that it should be allowed to participate, concluding that the Navy's decision was reasonable.

³ FHWA's Notice of Proposed Rule Making for Design-Build Contracting on Friday, October 19, 2001, pages 53288 - 53311, proposed regulation 23 C.F.R. 637.207 (a) (iv).

⁴ FHWA's Notice of Proposed Rule Making for Design-Build Contracting on Friday, October 19, 2001, pages 53288 – 53311, at p. 53297.

⁵ See NCHRP Report 451, *Guidelines for Warranty, Multi-Parameter, and Best Value Contracting*, p. 5.

In addition, at least two design-build transportation projects have faced protests relating to disqualification of a proposer for failure to meet financial requirements. For one project, the judge ordered the agency to add the team to the shortlist; for the other, the judge upheld the owner's decision not to pre-qualify the firm. The former decision was based on the judge's concerns regarding organizational conflicts of interest within the selection committee, and did not examine the financial data that was the basis for the decision.

Pre-Proposal Communications: The case summaries reviewed did not reflect any reported cases regarding pre-proposal communications. However, issues have arisen in at least two design-build transportation projects that are noteworthy.

In one case, questions asked by proposers were answered individually, and it was not clear whether the same information was in fact provided to all proposers. In order to avoid this situation, it is advisable for questions to be asked and answered in writing with the same document provided to all proposers. It is also beneficial to produce an updated and consolidated set of questions and answers, and distribute it to the proposers, before the proposal due date.

For another project, involving numerous one-on-one meetings, information regarding the degree of latitude permitted in the proposal in a particular area was provided to certain proposers in those meetings but not others. The proposer who was not advised of the owner's intention provided a proposal that was inconsistent with the owner's expectations. The proposal was determined to be non-responsive and the owner advised the proposer that it would not receive a stipend. The proposer protested this decision, and the owner ultimately decided to pay the stipend. In order to avoid this type of situation, it is advisable to limit the number of one-on-one meetings following issuance of the RFP and to take steps to ensure that information provided by the owner to one proposer is also given to the others. Owner representatives in one-on-one meetings conducted after issuance of the RFP should be made aware of the risks of protests based on allegations that the playing field is uneven.

Alternative Concepts: The case summaries reviewed did not reflect any reported cases regarding alternative concepts. However, at least one procurement involved a protest relating to pre-approved concepts. In that case, a proposer was advised that its concept would be acceptable only if approved by a third party. The proposer included the concept in its proposal, stating that it would seek approval, but did not provide any information regarding the steps that would be followed to obtain approval. The agency believed that the concept, as proposed, was not acceptable, and reviewed the proposal without considering the option associated with the concept. A protest was filed. The contracting officer reviewed the original conditional approval, determined that the option should have been considered, and directed the evaluators to re-evaluate the proposal. The re-evaluation did not affect the original selection decision, and no further protest was filed.

The risk of occurrence of this situation could be reduced by careful review of conditional approvals of technical concepts to ensure that the owner's intent is clearly stated.

Issues Relating to Proposals and Award: There are a number of reported cases concerning protests of award of design-build contracts. A number of awards have been overturned based on a determination that the agency was subject to a competitive bidding requirement and did not have the ability to use an alternative procurement process. However, as a general matter, where the agency has the authority to award contracts based on a best-value decision, the courts will defer to the agency's discretion. One exception to this rule concerns use of "past performance" history as an evaluation factor. Among other things, the courts will scrutinize the process followed by the agency in determining the proposer's past performance grade, and may overturn the procurement decision if the past performance grade affected the selection and cannot be justified.

Other proposal-related issues faced by transportation agencies using design-build include the need to deal with prices offered that exceed the maximum budgeted amount available, non-responsive proposals, and proposals that deviate from RFP requirements.

With regard to prices in excess of the budget, the available solutions vary depending on the agency's procurement authority and the terms and conditions of the RFP. Some solutions include:

Discussions with proposers within the competitive range, followed by request for best and final offers

Pre-award negotiations with the selected proposer

Post-award negotiations with the contractor.

Several design-build project owners have dealt with non-responsive proposals:

For one project requiring pricing to be provided for a 15-year O&M term, one of the proposers only provided six years of pricing. When offered the opportunity to provide a revised pricing form, the proposer failed to do so. Its proposal was not considered.

In two different cases, a project owner notified a proposer that it would not receive a stipend because its proposal was nonresponsive. In one case the proposer protested and a determination was made that the owner should pay the stipend (in part because the other proposers had asked whether they could take that approach and were told not to, but that information was not conveyed to the proposer in question). In the other case the proposer did not protest the decision.

For one design-build project, the owner received a proposal that deviated from the contract requirements as interpreted by the owner. The owner issued a request for best and final offers including a clarification to the provision that had been misinterpreted.

4.8.3 Environmental Litigation

A number of design-build projects have been the subject of challenges regarding compliance with environmental laws, including the San Joaquin Hills Toll Road in California, the El Portal project in Yosemite, and the Legacy Parkway project in Salt Lake City. These cases do not preclude agencies from using design-build for projects that require environmental analysis. However, they highlight the need for agencies to analyze the risk of future environmental litigation in deciding whether and how to use design-build for a particular project and in structuring the procurement and contract documents for the project.

San Joaquin Hills Toll Road: The San Joaquin project was the subject of numerous environmental actions, including one that resulted in a 1993 injunction against a significant portion of the project. This action, which was brought by The Laguna Greenbelt, Inc., is described below. Because the north and south ends of the project had independent utility and were not enjoined, the design-build contractor was able to work around the injunction and in fact completed the project several months before the March 1997 completion deadline. The contract provided for a time extension and payment of damages due to delays in the critical path caused by environmental injunctions, and allowed the owner the option to pay for acceleration in lieu of giving a time extension. The contractor received a price increase for changes in the work and acceleration costs directly attributable to the injunction.

The Laguna Greenbelt, Inc., et al. v. U.S. Department of Transportation, et al. (U.S. Dist. Ct., C.D. Cal. No. SACV93-0499 LHM (RWRx). On January 22, 1993, four environmental organizations filed a lawsuit in the U.S. District Court, Northern District of California, against the Federal Highway Administration ("FHWA"), other federal agencies and officers, and the TCA, alleging that the defendants did not comply with federal law in its approval of the Corridor. Upon motion by the TCA, the matter was transferred to the U.S. District Court for the Central District of California. The complaint sought a declaration that the FHWA violated applicable federal law, an order setting aside the approval of the Corridor by FHWA, and injunctive relief prohibiting any action altering the physical environment until defendants have complied with applicable federal laws. On September 7, 1993 the Court issued a partial preliminary injunction pending the trial on the matter. The preliminary injunction authorized the TCA to initiate construction activities on the northern and southern portions of the Corridor, but prohibited construction activities on the central portion pending the trial in this matter. On June 14, 1994 the Court granted the TCA's motion for summary judgment in its entirety and lifted the preliminary injunction. The plaintiffs then appealed the matter to the Court of Appeals for the Ninth Circuit and requested an emergency injunction pending appeal. On June 22, 1994 the Ninth Circuit Court of Appeals granted plaintiffs' application for an injunction pending appeal in accordance with the terms of the District Court's prior preliminary

injunction. In December 1995, the Ninth Circuit Court of Appeals affirmed the decision of the District Court and dissolved the injunction.

El Portal Roadway: An environmental action was brought against the Department of the Interior in 1999 to enjoin its El Portal highway reconstruction project. The complaint alleged violations of NEPA and the Wild and Scenic Rivers Act, and resulted in an injunction against a portion of the project pending further study, as described below. Work under the design-build contract was completed in October 2000. It appears that the agency responded to the injunction by removing the enjoined work from the contract.

Sierra Club v. Babbitt, 69 F. Supp. 2d 1202, 1999 U.S. Dist. LEXIS 16708, 50 Env't Rep. Cas. (BNA) 1263 (E.D. Cal. 1999). Flooding in January, 1997 severely damaged the El Portal road in Yosemite National Park, closing it for five months. The National Park Service determined that permanent reconstruction work was in order, and issued an environmental assessment for the project on August 22, 1997. FHWA's Central Federal Lands Highway Division awarded a design-build contract for the project on June 1, 1998, and construction work commenced in September, 1998. On February 19, 1999 an action was filed by the Sierra Club and a local environmental group; plaintiffs filed a motion for summary judgment on May 6, 1999; and on May 25, 1999 the defendants filed an opposition and counter motion for summary judgment. In his July 12, 1999 judgment, Judge Ishii ruled that numerous violations had occurred, but only enjoined a portion of the project--Segment D, the portion of the roadway extending from the 120/140 Highway split to the Pohono Bridge in the west end of Yosemite Valley. The decision prohibited any work within Segment D (other than sewer repairs and necessary slope stabilization) until after completion of a Comprehensive Management Plan for the Merced River. With respect to the remaining 6.4 miles of the project, the judge prohibited the erection of any stream-side wall rising more than 27 inches above the surface of the road, but otherwise permitted work to proceed.

Legacy Parkway: In January, 2001, shortly following the Utah Department of Transportation's award of a design-build contract for the Legacy Parkway project, an environmental action was brought to enjoin the project. The Tenth Circuit issued an injunction in November 2001, after construction was already under way, and in September 2002 issued a decision invalidating the environmental impact statement and 404 permit in certain respects. As of October 2002, the design-build contractor is continuing to perform certain work not affected by the injunction, pursuant to a standby agreement. The Department has stated that it remains committed to finding solutions to the transportation challenges that the Legacy project is intended to solve, but it is still evaluating the situation and has not yet determined how it will proceed or what action will be taken with regard to the design-build contract.

Utahns for Better Transportation v. U.S. Department of Transportation (U.S. Dist. Ct., D. Utah No. 01-0007). On January 17, 2001, a coalition of

environmental groups filed an action alleging violations of NEPA, the Clean Water Act and Section 4(f). On January 31, 2001, the Sierra Club filed suit claiming violations of air quality conformity requirements and that mobile source air emissions from the project will hinder attainment of ozone standards. On August 11, 2001 the judge dismissed the consolidated actions. The plaintiffs appealed to the Tenth Circuit, which granted a preliminary injunction in November 2001. On September 16, 2002, the Court remanded the case to the District Court judge, holding that the EIS was inadequate and that the Corps of Engineers had acted arbitrarily and capriciously in issuing a 404(b) permit. The decision was based on the following facts:

- elimination of an alternative alignment based upon inadequate cost estimates
- failure to consider alternative sequencing of the Shared Solution (i.e. expanding I-15, developing Legacy and expanding transit)
- failure to consider integration of the Legacy Parkway and transit
- failure to consider wildlife impacts (analysis of wildlife impact was inadequate because it was limited to the area within 1,000 feet of the right-of-way).

The court also held that the Corps of Engineers acted arbitrarily and capriciously in issuing a 404(b) permit, based on the following grounds:

- issuing a permit with insufficient information to determine whether an alternative alignment was practicable
- failure to consider whether a narrower median was a practicable alternative
- failure to consider alternatives that would reduce right-of-way requirements
- failure to consider the impacts to wildlife.

Discussion: The above cases show the necessity of considering the risk of environmental litigation in the design-build planning process. Projects that involve sensitive environmental issues are likely to be challenged, regardless of the delivery methodology chosen. Agencies should consider steps to reduce the likelihood that an action will be brought, to increase the probability of success if an action is brought, and to mitigate damages to the agency and the contractor if an injunction is issued.

Most agencies elect to complete the NEPA process prior to award of a design-build contract. Although a few agencies have chosen to award design-build contracts prior to

completion of the NEPA analysis (in at least one case integrating the designer-builder into the NEPA planning process), FHWA discourages such an approach. Regardless of the approach taken, one of the first decisions that must be made in planning a design-build procurement concerns the level of preliminary engineering required to ensure compliance with NEPA and similar environmental laws. This may vary from project to project and levels of preliminary engineering (and NEPA needs) may vary within components or sections of a project. In some critical NEPA areas, it may be necessary to take a piece of a project to 100% design.

As indicated by the below excerpts from the El Portal case, the judge in that case was concerned about the interrelationship between NEPA compliance and the agency's decision to use design-build:

[Concerns Regarding Lack of Opportunity for Public Comment and Description of the Project Used as Basis for FONSI]]

"In their Reply, Plaintiffs reiterate at length their claim that the design/build nature of the Project did not provide an adequate project description. In response to Defendants' claim that the Phase I design plans were incorporated by reference into the Revised or Final EA, Plaintiffs correctly argue that both the Phase I design plans and the Request for Proposal ("RFP") were developed after the close of public comment, so that the public did not have an opportunity to review and comment upon them. Plaintiffs also correctly point out that the Final EA, into which Defendants incorporated by reference the Phase I design plans, was not subject to public comment. . . .

"In addition to arguing that the public did not have an opportunity to review the document relied upon by Defendants to demonstrate that they adequately defined the Project, Plaintiffs argue that NPS did not have adequate description of the Project before it reached its final finding of no significant impact. Plaintiffs argue that only the documents the agency had before it at the time it issued the FONSI can be relied upon to support Defendants' position. Specifically, Plaintiffs claim that Defendants could not have considered the Phase I design plans or the Biological Assessment, because they were published only a few days before the publication of the Revised EA." (69 F. Supp. 2d at 1216.) [The judge granted summary judgment on two causes of action regarding violation of NEPA.]

[Concerns Regarding Specificity of Revegetation Plans That Were the Basis for the Environmental Assessment]

"The court concludes that in essence, Plaintiffs contend that the revegetation plans provided by Defendants are not sufficiently specific, while Defendants argue that because of the nature of the Project as a design/build project, they are unable to provide site-specific revegetation

plans until the Project is completed. After reviewing all of the parties' arguments, the court concludes that Defendants' reliance upon a revegetation plan that was not yet developed in issuing the EA adds weight to Plaintiffs' argument that substantial questions exist as to whether the Project will have a significant effect on the environment." (*Id.* at 1224.)

"Defendants assert that to date, ten orders for revegetation work have been issued, and that every one has been completed on time and in accordance with contractual requirements. Plaintiffs do not dispute this, or cite any defects in this work. Further, Defendants assert that the revegetation [**163] cannot be accomplished until after completion of the heavy earthwork, but that the revegetation plan for the Project is now being developed and will be implemented. The court finds that Defendants' failure to develop a revegetation plan before this time is clearly attributable to the "design/build" method of construction, and has resulted in an impairment of Plaintiffs' ability to assess the impacts of the Project. However, the court finds that Plaintiffs have not demonstrated irreparable injury in connection with the tardy completion of the revegetation plan sufficient to support injunctive relief. See Weinberger, 456 U.S. at 313 (holding that a federal judge considering a request for equitable relief is not obligated to grant an injunction for every violation of law)." (*Id.* at 1259.)

For the most part the judge's concerns appear to stem from an underlying belief that the agency should have proceeded with an environmental impact statement instead of an environmental assessment and FONSI. Nevertheless, the judge also indicated concern regarding the level of design and planning was used as the basis for the environmental assessment and FONSI and the fact that the public was not allowed the opportunity to comment on the design that was used as the basis for the environmental assessment. Consequently, even though the El Portal case was resolved at the district court level, and thus does not constitute binding precedent for unrelated cases, each agency that plans a design-build project would be well-advised to consider the concerns raised by the judge and take appropriate action to avoid similar arguments with regard to its project.

4.8.4 Contract Disputes

Disputes Regarding Contract Interpretation: There are relatively few published cases regarding design-build contract issues (which is consistent with the premise that use of design-build reduces the opportunity for disputes). Most of the reported cases appear to involve disagreements regarding the scope of the contractor's work. Design-build contract disputes generally fit into one of the following categories:

Contract documents include prescriptive specifications or a preliminary design that fails to conform to performance or other contract requirements

Contract documents contain ambiguities such as failure to specifically describe work that the owner believed was included in the scope but that the contractor failed to include in its price

Contract does not specifically deal with liability/responsibility for changes in project requirements affected by designer-builder design choices (including matters such as right-of-way acquisition, utility relocations, construction of walls, replacement of impacted wetlands or habitat, remediation of contaminated materials or groundwater, and future operations and maintenance)

Reported cases in the first category are reflective of the general rule that contract interpretation is dependent on the specific contract terms, conditions and circumstances. In some cases the designer-builder was required to provide an end product that complied with the contract requirements, and advised that it should have asked for a scope clarification during the procurement process. In others the owner was considered to have provided an implied warranty that the contract requirements will be met if the design and construction complies with the prescriptive specifications, regardless of exculpatory language in the RFP requiring proposers to examine the RFP documents for conflicting language and ambiguities and to ask the owner for clarification before the proposal due date.

In order to avoid disputes regarding the intent of the contract documents, it is critical for the owner to conduct a thorough review of the documents, prior to the proposal due date, to determine whether the project is accurately and completely described. In addition, where the documents give the contractor wide latitude in designing the project, the owner may want to include contract provisions to ensure that decisions by the designer-builder will be in the best interests of the project.

QA/QC Issues: The case summaries reviewed did not reflect any reported cases regarding project quality. Nevertheless, a number of transportation agencies have had to deal with a failure of the design-build work product to meet the contract specifications which might have been avoided had proper QA/QC procedures been followed. Solutions include requiring the work to be corrected so as to comply with the requirements, requiring additional work to be performed to resolve the problem, requiring the contractor to pay for the reduction in quality (either through a reduction in the contract price or a payment to the owner), or a combination of the foregoing.

Disputes Regarding Change Order Pricing: The case summaries reviewed did not reflect any reported cases regarding change order pricing. This is an ongoing administrative concern for design-build as well as non-design-build projects, and disputes regarding pricing will undoubtedly ultimately reach the courts in the future. Issues that have arisen on various design-build projects include:

- Disputes regarding what should be considered a direct cost and what is included in the markup for overhead expense (such as CAD computer expense; bond premiums; costs of QC personnel, and overtime expense).

- Disputes regarding the amount of credit allowable for deleted work.
- Negotiations regarding the markup allowable for time and materials work.

Schedule-Related Claims: Although design-build may reduce opportunities for delay claims due to the transfer of control to the design-builder, it does not entirely avoid such claims. Whenever the project owner retains responsibility for aspects of the project (such as design reviews or provision of right-of-way), the possibility exists that the owner will cause a critical path delay. In addition, force majeure events may result in project delays. If a delay occurs, the potential liability can be significant.

Owner liability for such delays may be reduced by taking affirmative steps to avoid delay situations. It is also possible to provide contractually for the design-builder to assume a certain degree of responsibility for delays beyond the control of both parties. Notification requirements can also have the effect of reducing owner liability.

Disputes Involving Restrictive Specifications or Approval Requirements: Many owners are concerned regarding liability associated with “approvals” of design and construction, believing that the act of approval may, in and of itself, be deemed to result in a transfer of liability. Design-builders have been known to argue that approval of a design which deviates from the specifications constitutes a waiver of the right to later require the design to be corrected. There are very few cases in this area.

In *Fru-Con Construction v. United States*, 42 Fed.Cl. 94, 97 (1998), the court specifically held that the government’s approval of design specifications furnished by a contractor did not relieve the contractor from responsibility for defects. The court held that the government’s approval of specifications submitted by the contractor did “not relieve the Contractor of the responsibility for any error which may exist, as the Contractor . . . is responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.” (42 Fed.Cl. at 97, fn 1.) The court rejected the contractor’s arguments that the government’s approval constituted an implied warranty and that it relieved the contractor from responsibility for the design under the contract.

The case of *Brunson Assocs, Inc.*, ASBCA No. 41201, 94-2 BCA ¶ 26,936 (1994) involved an Army Corps design-build contract for two fabric structures. The design-builder argued that the government should share in the liability for defective design on the theory of “comparative fault”, since the government participated in the design review and approval process. The Board rejected the design-builder’s arguments, holding that the government had not been negligent because its personnel were not actively involved in the design efforts and had no experience with these types of structures. Moreover, the defect that caused the structures to collapse hadn’t been a subject of any design review comments by the government; nor was it discussed in design meetings. The Board also relied on a provision in the Federal Acquisition Regulation stating that

review, approval and acceptance of the design by the government did not relieve the contractor from liability.

Based on a line of recent cases, it appears that requirements for owner approval of the design, when combined with a relatively high level of design provided by the owner, may result in retention of design liability by the owner. Three cases handed down in 2001 considered defective specifications and whether disclaimer language in the contract was effective to transfer liability for the defects to the design-builder. All of these cases resulted in rulings in favor of the design-builder, concluding that under the specific circumstances of each case the owner had retained liability for the errors. These conclusions were based in part on the relatively high level of design provided by the owner and the limited time allowed to the proposers to review the owner's design, combined with the degree of control over the post-award design retained by the owner in each case.

4.8.5 Summary of Legal Issues

There have been relatively few legal challenges to the use of design-build techniques. Where such challenges occurred, it was generally in the application of a particular design-build technique by an unsuccessful proposer, often due to a procedural error by the owner.

With regard to environmental challenges, the courts have found no conflict with the use of design-build techniques as long as there was compliance with NEPA requirements. Practically, this meant defining the project or portions of the project thoroughly enough to identify environmental impacts in the NEPA process.

5.0 Summary

Although the principles behind design-build contracting are used uniformly among the agencies surveyed, the implementation of design-build is varied, often due to the attitude and experience of the agency with design-build and the relationship that exists with the contracting community. The agencies surveyed usually developed new procedures for the design-build procurement process and did not use a modification of their existing design-bid-build process. The method of selecting projects and the allocation of risk, as well as the administration of design-build contracts, usually required that new approaches to procurement be established.

The New York State Department of Transportation's existing contracting practices and procedures for the capital program are long established, reliable and highly developed. Those practices and procedures have been successfully used to deliver a range of projects that vary in both scope and dollar value. However, those practices and procedures may not be the best approach to deliver projects in the shortest timeframe or in a period of reduced staffing levels.

The concept of issuing calls for letters of interest, issuing requests for qualifications, shortlisting firms that meet certain qualifications, issuing requests for proposals, and making a best value selection are not contemplated by the current NYSDOT contracting processes and procedures. New documents, and new administrative and management procedures will need to be developed to allow for the proper control of the design-build procurement process.

However, the biggest change that will be required by NYSDOT will be in the approach to the use of design-build. The survey shows that successful use of this method of procurement requires a change in attitude and a cultural shift in working with the construction and consultant industries. Contractors for a project will become responsible for many of the activities that currently are the responsibility of the agency. The contractor will have to accept those responsibilities and the agency will have to let them go. There will be a closer working relationship between the two parties and a greater mutual trust that both are focused on producing a quality product.

The agency will develop preliminary plans, specifications, and contract requirements to some level, and will need to be prepared to allow the contractor to complete those documents and perform the construction in conformance with those plans, specifications, and contract requirements. The agency will need to develop means of assuring itself and the public that the quality they normally achieve is in the final product without performing detailed review or inspection of the work. Part of that approach is a trust that the contractor is performing responsibly and is equally interested in a quality product.

The benefit that the agency can expect to gain is the faster delivery of the project, a smaller amount of staff required for project administration and management, and innovative design and construction techniques. Some agencies surveyed observed that cost savings were also obtained.

APPENDIX 1

Federal Highway Administration Special Experimental Projects No. 14

DESIGN-BUILD PROJECTS APPROVED UNDER SEP-14

STATE	BRIEF DESCRIPTION /LOCATION	Programmatic Concept	FHWA CONCEPT	CONTRACT AMOUNT	AWARD METHOD	WARRANTY PROVISION	AWARD DATE	COMPL DATE	COMPL DATE	EVALUATION DATE	EVALUATION REPORT
		Programmatic Approval	APPROVAL	(millions)							
1 AL	Ferry Boat		16-Apr-97	\$0.7	Low Bid		02-Jul-98				
2 AL	Resurface , Replace Bridge		16-Apr-97								
3 AK	Ocean Class Ferry Boat		07-Dec-92	\$80.4	Adjusted Bid	18-month general	06-Nov-95	28-Jun-98			
4 AK	Whittier Tunnel		01-Nov-96	\$57.0	Adjusted Bid	2-year warranty	01-Jun-98	30-Jun-00	30-May-00		01-Mar-99
5 AK	Very Fast Vehicle Ferry (option to buy up to 5 ferries)		24-Jan-00		two-step sealed bid						
6 AK	Glenn-Parks Interchange Project		12-Oct-01		Best value						
7 AZ	Emergency Relief Bridge Replacement			\$3.5	Low bid						
8 AZ	I-10/Cortaro Rd Interchange		11-Feb-97	\$2.8	Adjusted Bid						
9 AZ	I-17 Thomas Road to Dunlap Avenue, Phoenix		06-May-98		Adjusted Bid				01-Jul-00		
10 AZ	AZ State Route 68 near Kingman AZ, 13.5 miles reconstruction		27-May-99								
11 AZ	US Route 60		04-Apr-00		Adjusted bid						
12 CA	Emergency Relief - LaCienega / Venice Undercrossing		16-Jun-94	\$3.9	Low Bid		12-May-94	31-Oct-94		25-May-94	N/A
13 CA	SR-125		05-Mar-97				06-Jan-91		26-Jun-05		
14 CA	TCA Foothills South -		19-Mar-99								
15 CA	TCA - Glenwood-Pacific Park Drive		22-May-00		low bid	one-year materials and workmanship					
16 CO	Woodland Park urban street			\$0.7	Low Bid						
17 CO	I-70 Reconstruction, MP 336.8 to 11.4		14-Mar-97	\$20.7	Low bid		03-Jun-97		01-Jun-99	01-Nov-97	CDOT
18 CO	I-70 reconstruction		06-Jan-98				01-Apr-98	01-Nov-99			
19 CO	Colorado Transportation Management System - System Integrator		26-May-98								
20 CO	I-25 near Wellington, CO, 27 km roadway reconstr. & low bid programmatic appr.	1	24-Oct-97		Low Bid		22-Feb-98		01-Sep-99	none	
21 CO	Southeast Corridor Denver I-25		02-Mar-01		Upset limit	1-yr general; 10-year pavement					
22 DC	Enhanced I&M station (auto emission monitoring)		21-Aug-97		Adjusted Bid	2-year warranty	31-Jan-98		30-Apr-99		
23 DC	Local Street Upgrading (by EFLHD)		02-Mar-01		High Comp Score						
24 DC	DC DOW Anacotia Riverwalk and Trail Project		31-Aug-01		High Comp Score						
25 DE	Choptank Road over Back Creek		27-Mar-00	\$1.2	Adjusted bid	2-year warranty for structure, pavt, drain.	11-Oct-00	12-Dec-01		n/a	n/a
FL	Florida Design-build program approval *	1	12-Sep-96	12-Sep-96	Adjusted Bid						
26 FL	Replace Movable Bridge, Ringling Bridge		13-Oct-95	\$56.3	Adjusted Score	5 year	Jan-01		May-03		
27 FL	I-75 Peace River Bridge		*		Adjusted Score	5 year	Mar-01		Jun-03		
28 FL	I-75 Bee BridgeRepair		*	\$1.5	Adjusted Score	5 year	May-01				
29 FL	Bridge Replacement St. George Island		*	\$71.7	Adjusted Score	10 year warranty	Oct-99		Oct-03		
30 FL	I-10 Bridge Replacement Blackwater		*	\$28.3	Adjusted Score		Nov-65	Jan-98			
31 FL	SR 704 Royal Park Bridge		*	\$10.6			Jan-99		Aug-03		
32 FL	Pedestrian Overpass SR 15/600 Orange County		*	\$2.1	Adjusted Score		Apr-97	Dec-98			
33 FL	Pedestrian Overpass,SR 483/ Clyde Morris Volusia Co.		*	\$1.1	Adjusted Score		Apr-97	Oct-98			
34 FL	Pedestrian OverpassI-95 a Fay Blvd		*	\$1.0	Adjusted Score		Sep-98				
35 FL	Resurfacing SR 50		*	\$0.6	Low Bid		Feb-99				
36 FL	BridgeReplacemntI-4 overSt. Johns		*	\$101.9	Adjusted Score		Dec-00				
37 FL	Bridge WideningI-75 over Panasoffkee			\$19.3	Adjusted Score		Dec-00				
38 FL	I-4 from US 441To Maitland			\$51.1	Adjusted Score		Jun-01				
39 FL	Resurfacing I-4 from Orange Co.To SR 434			\$6.6	Adjusted Score		Jun-01				
40 FL	I-4 Aux. Lanes From SR 536 To SR 528			\$18.9	Adjusted Score		Jun-01				
41 FL	I-4 Aux. Lanes SR 528 to SR 482			\$3.3	Adjusted Score		Jan-02				
42 FL	ITS System I-4 Lake Mary To Saxon Blvd			\$2.9	Adjusted Score		Dec-01	Jun-02			
43 FL	I-95 Palm Bay Rest Area			\$3.9	Adjusted Score		Feb-02				
44 FL	ITS I-95 Hurricane Evacuation System				Adjusted Score		Dec-01	Mar-03			
45 GA	I-95 Bryan County, N/O Jerico River to S/O US 17 (7.4 miles)		03-Dec-98	\$19.7	Low Bid		30-Jul-99		05-Feb-02		
46 GA	I-75 Turner-Crisp Cos., SR 159 to SR 300 (14.5 miles)		07-Dec-99	\$51.9	Low Bid		17-Nov-00		31-Oct-02		
47 GA	Programmatic design-build approval	1	22-Dec-00								
48 GA	I-75 Tift Co., N/O US-41 to the Turner Co. Line (8 miles)			\$33.2	Low Bid		27-Jul-01		31-Oct-03		
49 GA	I-95 Glynn Co., Horse Stamp Church Road to US-17 (7 miles)			\$27.5	Low Bid		25-May-01		31-Jul-03		
GA	Programmatic design-build approval	1	22-Dec-00								
50 HI	Kuihelani Highway on Maui		12-Sep-97		Low Bid				01-Apr-01		
51 IN	Indiana Design-Build Program Approval *		21-Jul-97		Low Bid						
52 IN	#1 I-65, Reconstruction--N. of SR 43 to S. OF US 24, Tippecanoe / White Co's		*	\$30.6	Low Bid	5-year warranty	28-Feb-98	14-Jul-99	31-Jul-99		
53 IN	#2 I-65, Reconstruction & Add Ln.-Cold Spring Rd. to I-465-Indianapolis, Marion Co.		*	\$76.5	Low Bid	5-year warranty	03-Mar-00	01-Sep-01	01-Oct-01		
54 IN	#3 I-65, Reconstruction& Add Ln.- 61 St. To I-80/94- Lake County		*	\$31.8	Low Bid		10-May-99	11-Nov-00	15-Dec-00		
55 IN	#4 I-65, Reconstruction & Add Ln.-61 St. Interchange to S. of US 30- Lake Co.			\$31.3	Low Bid		31-Oct-00	11-Dec-01	15-Dec-01		
56 IN	#5 I-65, Reconstruct I-65 / US-30 Interchange-Merrillville- Lake Co.			\$29.9	Low Bid		12-Dec-01		01-Jun-03		
57 IN	#6 I-80/94, Reconstruct of Harrison and Clark Steet Bridges over I-80/94- Lake Co..			\$5.5	Low Bid		01-Mar-02		01-Nov-02		

58 IN	#7 I-465 / I-70, Recostruction of Interchange in Indianapolis, Marion County	*	\$67.1	Low Bid		12-Mar-01	20-Nov-02	
59 MA	Route 3 North, from Route 128 to the NH border	11/23/99	\$385.0	Best Value	DBOM/Finace for 30-years	02-Aug-00	01-Mar-04	15-Oct-00
60 MD	US113 from US50 to MD589, four-lane highway on new align, Worcester Co	22-Oct-98	\$10.3	Prequal+lowbid	No	16-Feb-99	10-Oct-00	01-May-00
61 MD	MD32 at Samford Rd, interchg constr, Anne Arundel Co	15-Feb-00	\$6.5	Prequal+lowbid	No	01-Jul-00	29-Sep-01	15-Nov-01
62 MD	MD695 from I-97 to MD10, widening, Anne Arundel Co	05-Oct-99	\$9.4	Prequal+lowbid	No	20-Feb-01	TBD	20-May-02
63 MD	MD32 at Airfield Rd, interchg constr, Anne Arundel Co	18-Jan-01	\$10.0	Prequal+lowbid	No	11-Jul-01	TBD	31-Aug-02
64 MD	US50 from US301to MD410, widening for HOV, Prince George's Co	18-Jan-01	\$19.0	Prequal+lowbid	No	09-Sep-01	TBD	07-Oct-02
65 MD	US113 from Jarvis Rd to Delaware state line, dualization, Wicomico Co	18-Jan-01	\$10.7	Prequal+lowbid	No	02-Nov-01	TBD	31-Oct-03
66 MD	US29 from Blackburn to Dustin Rd, widen/interchg improvements, Montgomery Co	18-Jan-01	TBD	Prequal+lowbid	No	TBD	TBD	FY04
67 MD	MD216 from US29 to I-95, new alignment, Howard Co	18-Jan-01	TBD	Prequal+lowbid	No	TBD	TBD	FY05
MD	Programmatic design-build approval	1	18-Jan-01					
68 ME	Bath-Woolwich Bridge Replacement	09-Oct-96	\$46.6	Adjusted bid		10-Sep-97	01-Jul-00	
69 MI	Detroit Freeway Management System, ATMS / ATIS	03-May-94	\$32.8	Adjusted Bid	2-year general, options for years 3-6	20-Apr-95	01-Apr-97	26-Nov-96 MDOT
70 MI	I-94 / Vining Rd Interchange	26-Aug-94	\$14.9	Adjusted Bid		14-Jun-96	07-Nov-97	
71 MI	US 23 pavement rehab project	28-Dec-95	\$7.6	Adjusted Bid	5-year pavement,	13-Sep-96	11-Oct-97	
MI	Bridge Replacement Program *	30-Jun-95		Low bid / A+B				
72 MI	I-94 Frazho& Martin Bridge Deck Replacement	*	\$1.7	Low bid / A+B		01-Oct-96	30-Oct-97	01-Aug-97
73 MI	I-96 Wixom Bridge Deck Replacement	*	\$1.1	Low bid / A+B		01-Oct-96	01-Oct-97	01-Oct-97
74 MI	I-75 Gardenia Bridge Superstructure replacement	*	\$0.9	Low bid / A+B		01-Dec-96	17-Oct-97	01-Oct-97
75 MI	I-69 Wadham Bridge Superstructure replacement	*	\$0.6	Low bid / A+B		01-Dec-96	30-Aug-97	01-Oct-97
76 MI	I-94 Burns Bridge Deck Replacement	*	\$1.1	Low bid / A+B		01-Oct-96	05-Sep-97	01-Sep-97
77 MI	US-24 Rouge R. Bridge Deck Replacement	*	\$1.7	Low bid / A+B		01-Oct-96	02-Dec-97	01-Oct-97
78 MI	M-10 Lafayette & Us12 Bridge Deck Replacement	*	\$3.5	Low bid / A+B		01-Jan-97	04-Apr-98	01-Jul-98
79 MI	M-10- Warren Bridge Deck Replacement	*	\$2.0	Low bid / A+B		01-Feb-98	04-Apr-98	01-Jul-98
80 MI	M-10 Greenfield Bridge Deck Replacement	*	\$2.1	Low bid / A+B		01-Oct-98		01-Jun-98
81 MI	I-75 Second Bridge Deck Replacement	*	\$1.5	Low bid / A+B		01-Nov-96	15-May-98	01-Oct-97
82 MI	I-96 BL GTW RRBridge Deck Replacement	*	\$3.8	Low bid / A+B		01-Feb-97		01-Jul-98
83 MI	I-696 M-10 Bridge Superstructure replacement	*	\$1.0	Low bid / A+B				01-Oct-98
84 MI	M-28 Ontonagon River Bridge Deck Replacement	*	\$0.7	Low bid / A+B				01-Oct-98
85 MI	I-94 Rouge River B& GTW RRBridge Superstructure replacement	*	\$4.9	Low bid / A+B				01-Oct-98
86 MI	I-94 Harper Bridge Deck Replacement	*	\$1.6	Low bid / A+B			02-Oct-98	01-Oct-98
87 MI	Beaver Island Ferry Boat	11-Jul-95	\$2.4	Low bid				
88 MI	I-275 reconstruction, 8.3 km, 5 Mile Road to I-696, Wayne and Oakland Co.	01-Sep-98		Low Bid	5-year warranty for concrete pavement only	04-Jan-99		
89 MI	I-69 and I-75 Weigh Stations	26-May-00		best value	5-year warranty for scales			
90 MN	I-35 pavement rehabilitation	04-Jun-96	\$7.7	Low bid		20-Aug-96		
NJ	Program approval for modified design-build procurement	28-May-97						
91 NJ	Route I-280 Access Ramps	12-Mar-96	\$4.6	Modified D-B		01-Jun-96	24-Jun-98	24-Jun-98
92 NJ	Local Bridge Projects 11th Ave & 14th St	12-Mar-96	\$1.8	Modified D-B		08-Oct-96	28-May-98	01-Oct-98
93 NJ	Local Bridge Projects Bordentown - Georgetown Rd	12-Mar-96	\$1.5	Modified D-B		10-Sep-96	30-Jan-98	
94 NJ	Local Bridge Projects Oakview Ave, Roosevelt and Westervelt Ave.	12-Mar-96	\$2.8	Modified D-B		20-Sep-96	24-Jul-98	02-Oct-98
95 NJ	Route 29 Improvements	12-Mar-96	\$70.9	Modified D-B		29-Sep-97	01-Dec-00	01-Jun-98
96 NJ	Routes 50 & 322 Interchange Reconstruction	12-Mar-96	\$8.4	Modified D-B		29-Jun-98		28-Sep-99
97 NJ	Route 35 Victory Bridge	12-Mar-96	\$84.8	Modified D-B		30-Jun-99		28-Sep-99
98 NJ	Route 9, 25K	12-Mar-96	\$57.9	Modified D-B		29-Jun-99		28-Sep-99
99 NJ	Enhanced I&M stations	04-Aug-97	\$63.2	Best Value		03-Aug-98		
100 NJ	Emergency Bridge Replacement over Peckman's Brook, Passaic County	19-Oct-99		Modified D-B				
101 NJ	Delaware River Tram between Camden NJ and Phildelphia, PA	15-Mar-00						
102 NJ	Route 52 between Somers Point and Ocean City	30-Jan-01		Modified D-B				01-Oct-06
103 NM	US Hondo Valley	31-Aug-01		best value				
104 NV	Reno Transportation Rail Access Corridor Project	31-Aug-01		best value				
105 NY	New York City DOT, pedestrian safety project	23-Jun-98		Adjusted Bid				01-May-00
106 NY	New York City DOT, Belt Parkway / Ocean Parkway Bridge	30-Aug-00		Adjusted Bid				
107 NY	Port Authority of NY and NJ - Traffic Surveillance on George Washington Bridge	27-May-99	\$17.5			25-Sep-97	20-Aug-99	
108 NC	CARAT ITS project	13-Oct-95	\$13.8	Adjusted Bid	2-year system maintenance provision	01-Sep-96	07-Apr-01	01-Apr-97 HNTB for NCDOT
109 NC	Statewide wetland mitigation	16-Nov-98		best value				
110 NC	Reconstruction of I-77 and programmatic use of D-B	14-May-01		adjusted bid w/ formula				
111 NC	I-26 Reconstruction from NC 225 to NC 280	18-Apr-01		Adjusted bid				
112 OH	OTT/ERI-2-44.103/0.000 roadway mill and resurface, deck overlays	*	\$2.6	Low bid		21-Jan-98	15-May-98	30-Nov-98
113 OH	WYA-231-27.868; Bridge replacement	*	\$0.5	Low bid		08-Oct-97	30-Jun-98	30-Jun-98
114 OH	Lor-252-8.738; Bridge replacement	*	\$2.0	Low bid		09-Jul-97	30-Sep-99	30-Sep-99
115 OH	LAK 2-12.231 Bridge replacement	*	\$2.0	Low bid		23-Oct-96	31-Oct-97	01-Jan-00
116 OH	TUS -800-36.967; bridge replacement	*	\$0.2			10-Jun-98	30-Jun-99	30-Jun-99
117 OH	chp / cla-68-0.0024.441 ; 1.2 km of new 4-lane highway 3 structures	07-Aug-96	\$13.9			13-May-98	11-Nov-00	31-Aug-00

118 OH	Toledo Lucas County marine passenger terminal		17-Jul-98	Low bid	1-year general, five year electr / mech				
OH	Program approval for a modified design-build program **	1	21-Jul-99						
119 OH	VAN-US127-12.39, replace 3 bridge decks		**	\$1.0 Low Bid		27-Oct-99	31-Aug-00	31-Aug-00	31-Oct-00
120 OH	ALL-IR075-29.548, replace Swaney Rd. bridge deck		**	\$0.7 Low Bid		18-Nov-99	6/30/2000	30-Jun-00	31-Oct-00
121 OH	LOR-IR090-10.76, 4 lane resurfacing & deck overlays		**	14 Low Bid		#####		31-Aug-02	31-Oct-00
122 OH	MED-IR271-0.00, complete pavement replacement		**	\$17.3 Low Bid	7 year pavement warranty	07-Mar-00		31-Oct-01	31-Oct-00
123 OH	ATB-SR045-19.92, SR45 over IR90 bridge widening		**	\$3.0 Low Bid	7 year bridge deck warranty	22-Mar-00	01-Aug-01	01-Aug-01	31-Oct-00
124 OH	STA-IR077-11.85, add 3rd lane & replace existing pavement		**	\$24.0 Low Bid	7 year bridge deck warranties	24-Feb-00		30-May-03	31-Oct-00
125 OH	GUE-SR660-4.98, replace 2 bridges		**	\$0.5 Low Bid		23-Dec-99	31-Aug-00	31-Aug-00	31-Oct-00
126 OH	MIA-IR075-7.948, add 3rd lane & replace existing pavement		**	\$45.5 Low Bid	Pavement and bridge deck warranties	01-Feb-00		20-May-03	31-Oct-00
127 OH	PRE-IR070-0.00, pavement rehab & bridge work		**	\$20.5 Low Bid		15-Mar-00	29-Oct-01	15-Oct-01	31-Oct-00
128 OH	GRE-US35J-0.00, pavement planning & overlay		**	\$10.5 Low Bid	7 year pavement warranty	06-Apr-00	22-Nov-01	15-Oct-01	31-Oct-00
129 OH	HAM-IR071-11.08, pavement planning & overlay		**	\$10.8 Low Bid		22-Mar-01		15-Aug-02	31-Oct-00
130 OH	HAM-IR275-32.27, pavement rehab & bridge work		**	\$29.5 Low Bid		16-Nov-00		31-Jul-03	31-Oct-00
131 OH	HAM-IR471-00.26, pavement rehabilitation		**	\$15.4 Low Bid		01-Mar-01		15-Jun-02	31-Oct-00
132 OH	ROS-SR159-0.00, pavement repair & overlay		**	\$2.3 Low Bid		19-Jan-00	14-Mar-01	15-Nov-00	31-Oct-00
133 OH	NOB-IR077-6.22, joint replacement & concrete overlay		**	\$10.6 Low Bid	7 year pavement warranty	10-Feb-00	10-Oct-01	30-Aug-01	31-Oct-00
134 OH	CUY-IR480-19.93, noisewall retrofit panels		**	\$2.5 Low Bid		07-Oct-99	18-Oct-00	30-Sep-00	31-Oct-00
135 OH	MAH-11-16.04, Bridge Deck replacements			\$4.1 Low Bid		01-Feb-01		30-Oct-02	
136 OH	ATH-33-10.41, Bridge Deck rehabilitation			\$1.8 Low Bid		26-Feb-01		02-May-02	
137 OH	TRU-80-9.08, Pavement & Bridge Rehabilitation			\$4.9 Low Bid		26-Feb-01		30-Jun-02	
138 OH	TUS-77-3.94, Pavement & Bridge rehabilitation			\$9.2 Low Bid		15-Feb-01		15-Aug-02	
139 OH	BEL-70-16.60, Sign Upgrading			\$0.8 Low Bid		01-Mar-01		30-Jun-02	
140 OH	ATB-11-23.33, Bridge deck replacement			\$0.7 Low Bid		01-Mar-01		11-May-02	
141 OH	SAN-6-14.76, Rehabilitate 3 bridges			\$1.8 Low Bid		22-Mar-01	07-Jan-02	31-Aug-02	
142 OH	SAN-20-14.86, Bridge Rehabilitation			\$0.8 Low Bid		22-Mar-01	07-Jan-02	31-Oct-01	
143 OH	POR-224-0.00, Resurfacing and Safety Upgrading			\$3.7 Low Bid		03-May-01		30-Jun-02	
144 OH	PRE-40-1.33, Bridge replacement			\$0.2 Low Bid		13-Sep-01		01-Jul-02	
145 OH	HAR-81-16.54, Bridge deck replacement			\$0.3 Low Bid		11-Oct-01		30-Jun-02	
146 OH	MOT-4-4.83, Bridge replacement			\$0.3 Low Bid		28-Dec-01		31-May-02	
147 OH	HEN-108-15.61, Bridge rehabilitation			\$0.9 Low Bid		20-Dec-01		31-Oct-02	
148 OH	PAU-613-22.02, Bridge replacement			\$0.6 Low Bid		20-Apr-00	01-Nov-01	31-Oct-00	
149 OH	FRA-71-14.39, Pavement rehabilitation, replacement, and safety upgrading			\$3.7 Low Bid		20-Apr-00		30-Sep-01	
150 OH	ALL-30-18.18, Bridge Deck replacements			\$2.2 Low Bid		05-Oct-01	25-Nov-01	31-Oct-01	
151 OH	SUM-77-22.32, Tower Lighting			\$1.7 Low Bid		05-Oct-00	21-Nov-01	30-Oct-01	
152 OH	HAN-103-16.57, Bridge Rehabilitation			\$0.5 Low Bid		16-Nov-00	01-Aug-01	05-Jul-01	
153 OR	I-5 reconstruction; 9.7 km; near Evans Creek, Rock Point		14-Sep-98	\$7.8 Adjusted bid		09-Feb-99	30-Dec-99		
154 PA	Wetland bank on US 220 project		11-Feb-97	Low bid					
PA	PennDOT Programmatic concept approval for modified design-build	1	08-Oct-97	Modified D-B					
155 PA	District 1 Warren Co, Expressway reconstruction		08-Oct-97	Modified D-B		30-Jun-00		16-Oct-01	27-Mar-01 27-Mar-01
156 PA	District 1 Veango Co., Bethel Sunville Rd., Bridge Replacement		08-Oct-97	Modified D-B					
157 PA	District 1-0 Erie Land Lighthouse Restoration		08-Oct-97	Modified D-B					
158 PA	District 2-0 Clearfield 53-A04 022C035 Bridge Replacement		08-Oct-97	Modified D-B					
158 PA	District 2 Mifflin County , Bridge over Kishacoquillas Creek		08-Oct-97	Modified D-B					
159 PA	District 2 McKean Bridges over Allegheny River and Railroad		08-Oct-97	Modified D-B					
160 PA	District 3-0 Tioga 0015-F13 037C1386 New 2 Lane Bridge on SBL		08-Oct-97	\$8.6 Modified D-B					
161 PA	District 3 Lycoming Deck Replacment on the Susquehanna River Bridge at Muncy		08-Oct-97	Modified D-B					
162 PA	District 4-0 Susquehanna 0706-570 045C034 Wyalusing Creek Bridge		08-Oct-97	\$2.4 Modified D-B		11-Jul-97	24-Sep-98	10-May-98	22-Feb-99 22-Feb-99
163 PA	District 4-0 Wyoming 0029-770 047C026 Bowman's Creek Bridge		08-Oct-97	Modified D-B					
164 PA	District 4 Luzerne, Bridge Replacement Carey Ave		08-Oct-97	\$27.5 Modified D-B		01-Feb-01		31-Dec-03	
165 PA	District 4-0 Susquehanna 1037-570 Bridge Replacement Dubois Creek		08-Oct-97	\$5.8 Modified D-B		21-May-01		11-Nov-01	
166 PA	District 4-0 Susquehanna 0011-573 Bridge Replacement Hallstead/Great Bend		08-Oct-97	\$6.5 Modified D-B		20-Jun-01		26-Mar-02	
167 PA	District 4-0 Wayne 9911-BRG New Bridge Church Street Honesdale		08-Oct-97	Modified D-B					
168 PA	District 4-0 Luzerne 9900-BRG Pedestian Bridge Wilkes-Barre		08-Oct-97	Modified D-B					
169 PA	District 4-0 Pike 0434-470 Bridge Replacement Sholola Bridge		08-Oct-97	Modified D-B					
170 PA	District 4-0 Pike 1011-470 Bridge Replacement Pond Eddy Bridge		08-Oct-97	Modified D-B					
171 PA	District 4-0 Luzerne 2010-371 Bridge Replacement		08-Oct-97	Modified D-B					
172 PA	District 5-0 Berks 0100-090 Passmore Bridge		08-Oct-97	Modified D-B					
173 PA	District 5-0 Lehigh Schnecksville Intersection		08-Oct-97	Modified D-B					
174 PA	District 5-0 Lehigh 0078-07M Emergency Superstructure Replacement		08-Oct-97	\$3.1 Modified D-B		24-Jul-00	22-Oct-00	15-Dec-00	
175 PA	District 5-0 Lehigh 0078 Interstate PM		08-Oct-97	Modified D-B					
176 PA	District 5-0 Schuylkill 0081-02B Bridge Replacement		08-Oct-97	Modified D-B					
177 PA	District 6-0 Chester 0029-50S 062C050 Bridge Replacement		08-Oct-97	\$1.0 Modified D-B		07-May-01		01-Jun-02	

APPENDIX 2

Survey of Public Agencies That Have Utilized Design-Build Transportation Projects

Appendix 2

SURVEY OF PUBLIC AGENCIES THAT HAVE UTILIZED DESIGN-BUILD TRANSPORTATION PROJECTS

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
AL	DOT	Ferry boat (\$.7M) bridge resurfacing/replacement	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
AK	DOT	Whittier Tunnel (\$57M) Ferry projects	General legislative authorization for agencies using state funds.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DOT is currently developing an RFP for a \$50M interchange project
AZ	DOT	I-10 emergency bridge replacement contract interchange I-17 segment, Phoenix 13.5 mile reconstruction SR 68 US 60	Authorization for pilot projects by DOT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ADOT actively sought legislative authorization, is proceeding with pilot projects and intends to seek further authorization—its experience in obtaining authorization and pursuing pilot projects are of interest
AR	DOT	none	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
CA	DOT	I-10 earthquake reconstruction SR-91 SR-125	Emergency powers; public – private partnerships (AB 680)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	I-10 was a unique project, DOT is not currently proceeding with other DB projects; AB 680 projects may be of interest
	Orange County Transportation Corridor Agencies	San Joaquin Toll Road Eastern Toll Road Glenwood Pacific Interchange Foothill-South Toll Road	Enabling legislation granted independent powers without restricting procurement methodology	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Greenfield projects completed 1996, 1998, interchange under construction—toll revenue financed—information regarding procurement, protests, project management, acceptance and warranties may be of use—also of interest to see evolution of procurement process over time

¹ Information regarding projects is based on review of a list of projects approved by FHWA as of May 2000, as well as personal knowledge of the review team.

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
	Alameda Corridor Transportation Authority	Alameda Corridor	Los Angeles City Charter permits "lowest ultimate cost" negotiated procurement	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	User fee project, close to completion—information regarding project management and procurement process may be of use; also lessons learned re utility relocation, quality
	BART	Airport LRT extension	Special legislation allowing BART to use low bid design-build	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	BART	Warm Springs extensions	General legislation permitting transit agencies to use design-build		New program might be of interest but it is still in the planning phase
	Los Angeles to Pasadena Metro Blue Line Construction Authority	Chinatown Aerial Structure Arroyo Seco LRT	Agency's enabling legislation specifically permits design-build	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Projects are under construction. Systems acceptance procedures may be of interest, also procurement process and project management lessons learned.
	Los Angeles County MTA	Eastside LRT extension	General legislation permitting transit agencies to use design-build	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	LRT project—RFP not yet issued
CO	DOT/RTD	Transportation Expansion Project	Authorization specific to DOT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Of interest since it is a major project that was recently awarded, federally funded, used best value procurement process, created DBE program to comply with new regulations
	DOT	Woodland Park Urban Street I-70 Reconstruction Transportation Management System			
	E-470	Toll Roads 27 km	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Greenfield toll road projects—procurement process, contract administration process may be of interest

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
	Northwest Parkway Public Highway Authority	10 mile toll road Denver	Did not research	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	Greenfield toll road project—warranty pricing may be of interest (in order to reduce project costs the warranty term was shortened by change order)
CT	DOT	Hartford – New Britain busway	Authorization for State departments and agencies	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	RFP not yet issued
DE	DOT	Choptank Road	Authorization specific to DOT	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DC	WMATA	parking garage subway extension	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1 parking structure completed; others not yet under construction
	District of Columbia	Enhanced I & M Station	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
FL	DOT	14+ highway and bridge projects	Authorization specific to DOT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Florida was one of the first departments of transportation to use design-build and undoubtedly has learned many lessons in the ensuing years
GA	DOT	I-95 I-75 widening	General legislation permitting design-build	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Legislation places constraints on procurement that are problematic
HI	DOT	Kuihelani Highway curbcut projects	Authorization for all governmental bodies	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
ID	DOT	None	Authorization for State, counties, cities and towns	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
IL	DOT	various smaller projects	Authorization for State & Regional Transportation Auth.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	City of Chicago	Airport extension	City council approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Qualifications – based selection process; currently in preliminary design phase
IN	DOT	8+ highway and bridge projects	did these pass? SB 24, HB 2021, HB 1279	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
IA	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
KS	Turnpike authority	Unknown	Specific authorization for turnpike authority	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
	DOT	None	Attorney General has opined that design-build may be possible for other agencies	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
KY	DOT	None	Authorization for State	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
LA	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
ME	DOT	Sagadahoc bridge (\$47M)	Authorization for DOT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	The project was completed in 2000—lessons learned re procurement process, bridge projects and warranties are of interest
MD	DOT	US-113 new highway (\$10M) MD 32	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	Maryland Mass Transit Administration	Baltimore – Washington Maglev project	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Still in planning phase
	Maryland Mass Transit Administration	Baltimore LRT extension	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
MA	MHD	Route 3 North	Project-specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Design-build-operate-maintain-finance project
	MBTA	Greenbush LRT	Project-specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Still in procurement phase
MI	DOT	21+ projects: I-275 reconstruction 4 bridge superstructure replacements ferry boat 11 bridge deck replacements weigh stations pavement rehab ATMS interchange	No specific legislation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	The DOT has engaged in a significant number of projects, and has undoubtedly learned lessons in the process. For a case study of an ITS center project, see http://www.itstdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13460.pdf
MN	DOT	Hiawatha LRT I-35 pavement rehab	Specific legislation for LRT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	Although this is a light rail project, it was developed by the Department of Transportation. Lessons learned regarding the procurement process and contract terms are of interest
MS	DOT	None	No specific authorization	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
MO	DOT	None	Legislation proposed (HB No. 71, SB 320)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8 state pilot projects authorized

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
MT	DOT	None	Authorization for Department of Transportation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
NE	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
NV	DOT	None	General legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	Clark County	Las Vegas Monorail	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Public-private partnership
	City of Reno	ReTrac rail project	General legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	RFP not yet issued
NH	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
NJ	DOT	Low bid projects best value I & M station	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	For lessons learned, see http://www.cf.fhwa.dot.gov/programadmin/contracts/nj_toc.htm
	DOT/SJTA/ private developer	Atlantic City/Brigantine Connector (\$190M) (tunnel)	Did not research	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	The project was completed 2001; public-private partnership among DOT, toll authority and private developer; lessons learned re tunnels are of interest
	New Jersey Transit	Hudson-Bergen LRT (\$800M) South New Jersey LRT	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DBOM: HBLRT completed 2000; SNJLRTS under construction
NM	SHTD	US 70 NM 528	Authorization for Highway Department pilot program	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Still in procurement phase
NY	New York City DOT	Pedestrian safety Belt Parkway/Ocean Parkway bridge	No specific authorization	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	Port Authority	JFK extension traffic surveillance	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	New York State OGS	?	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
NC	DOT	CARAT ITS Statewide wetland mitigation I-26	Authorization for Department of Transportation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
ND	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/ Survey	Remarks
OH	DOT	25+ projects	Authorization for DOT	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Department has used design-build for a number of projects. Evolution of procurement process is of interest--historically they used a low bid selection methodology, but are considering alternative selection methodologies
OK	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
OR	DOT	I-5 reconstruction (\$8M)	Authorization for tollway projects and public-private partnerships	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	Portland	I-MAX LRT	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
PA	DOT	22+ projects	Authorization for State	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Low bid selection process
RI	DOT	None	Authorization for public property and public works: "any type of contract which will promote the best interests of the state may be used" (except cost plus percentage or cost reimbursement).	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
SC	DOT	Conway Bypass Carolina Bays SC 170 3 bridge replacements	Authorization for Department of Transportation to enter into partnership agreements for financing and development of highways, roads, streets and bridges	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	FHWA often refers other states to SCDOT documents. SCDOT has a significant program and has undoubtedly learned many lessons. Unclear how SCDOT will proceed with procurements under new FHWA regulations.
	Greenville County	numerous projects	Did not research	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	Greenville County has been effectively using design-build for building and road projects. For the past 4 years they have successfully executed their annual Road Improvement Programs through the use of innovative, best value, stipulated sum, DB contracts where the contractor is responsible for all design, coordination with residences and businesses, and QC/QA.

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
SD	DOT	I-229 reconstruction	Authorization for public works projects	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
TN	DOT	None	No specific authorization	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	City of Nashville	ITS	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
TX	DOT	Toll roads: SH 183A SH 130	Authorization for Texas Turnpike Authority (Division of the Texas DOT)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Still in procurement phase
UT	UDOT	I-15 Reconstruction Legacy Parkway 114 th South Interchange ITS (\$5M) ITS (\$1.5M) ?Provo Canyon retaining structures	Specific legislation applicable to Department of Transportation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The recently completed I-15 reconstruction project was a major undertaking and should be reviewed as part of any survey of design-build highway projects in the U.S. Items of interest include the evolution of UDOT's procurement process and contract documents
	UTA	University Line	General d-b legislation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (survey only)	
VT	DOT	None	Authorization for State	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
VA	DOT	Pocahontas Parkway bridge	Authorization for all state agencies; various local agencies; public-private authorization for VDOT	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
WA	DOT	Tacoma Narrows bridge Reconstruction project Interchange	General d-b legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Projects not yet underway
	Sound Transit	Light rail tunnel project	General d-b legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
WV	DOT	1 small project	Authorization for state/county/local projects	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
WI	DOT	None	Authorization for Department of Transportation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	City of Milwaukee	Viaduct	Did not research	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
WY	DOT	None	No specific legislation	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

State	Agency	DB Projects ¹	Enabling Authority	Candidate for Interview/Survey	Remarks
US	Naval Facilities Engineering Command (NAVFAC)	Numerous projects over the past 20 years, including horizontal as well as vertical projects		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Design-build has become the Navy's preferred method for delivering projects. Due to the Navy's broad capability, and due to the wide array of projects, we believe there is much to be learned both about their procurement procedures and their experiences in developing different types of projects
	Federal Highway Administration (FHWA)	Reconstruction of El Portal Road in Yosemite National Park, Calif. (Central Federal Lands Highway Division of FHWA)		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	We believe it would be productive to interview FHWA to obtain the benefit of lessons learned in developing the El Portal project, particularly since the draft design-build regulations recently issued by FHWA would require state agencies to follow federal procurement rules

APPENDIX 3

Survey of Transportation Agencies That Have Design-Build Authority

Appendix 3

SURVEY OF TRANSPORTATION AGENCIES THAT HAVE DESIGN-BUILD AUTHORITY

State	Transportation Agencies with Authority (1)	Citation for Statutory Design-Build Authority (2)	DOT Procurement Process
1. AK	Authorization for all agencies for projects using state funds	ALASKA STAT. § 36.30.200	Competitive sealed proposals if appropriate findings are made; otherwise, competitive sealed bids
2. AZ	Authorization for: State Transportation Board; pilot projects by DOT	ARIZ. REV. STAT. §§ 28-7361, 7363, 7364 and 7365	2 phase process: pre-qualification then proposal; award is to lowest score when price is divided by technical score; time valued adjustments may be made to score
3. CA	Authorization for transit agencies, certain cities and counties	CAL. PUB. CONT. CODE §§ 20209.5 and 20133	N/A
4. CO	Authorization for DOT	COLO. REV. STAT. §§ 43-1-1401 <i>et seq.</i>	2 phase process: pre-qualification then proposal; any appropriate basis for award if basis is described in RFP; preference to Colorado residents, however if this may cause denial of federal funds then department will suspend preference for residence 43-1-1406; adjusted scoring if commission approves; award is to proposal providing best value to department
5. DE	Public-private initiative authorization allowing authorization for Secretary to solicit design-build proposals	DEL. CODE ANN. tit. 2, § 2003	Proposals solicited through RFP; Department authorized to assess non-refundable proposal review fee not to exceed \$50,000; each proposal weighed on its own merits and ranked according to selection criteria; only highest ranking proposal shall be selected.
6. FL	Authorization for DOT for buildings, major bridges and rail corridor projects	FLA. STAT. ANN. § 337.11(7)	Governed by rules adopted by Department (specifically allows shortlisting, request for proposals and award based on technical criteria)

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- (1) This survey should not be construed as legal advice regarding design-build authorization in any state. Please contact nsmith@nossaman.com with any additions or corrections.
- (2) This survey identifies legislation specifically permitting agencies to enter into design-build contracts and exclusive development agreements, and also identifies legislation specifically permitting agencies to use a best value procurement process for construction contracts (thus allowing design-build procurements to proceed without concern about differing procurement requirements applicable to design and construction contracts). This survey does not necessarily address authorizing legislation for franchise agreements or similar public-private partnerships.

State	Transportation Agencies with Authority (1)	Citation for Statutory Design-Build Authority (2)	DOT Procurement Process
7. HI	Authorization for all governmental bodies to use competitive sealed proposal procurement process	HAW. REV. STAT. § 103D-303	Allows discussions with offerers within competitive range, award to most advantageous offer
8. ID	Legislation stating that State agencies are not prohibited from using design-build	IDAHO CODE § 67-2309	None itemized.
9. IL	Specific authorization for Regional Transportation Authorities	70 ILL. COMP. STAT. 3615/4.06(b)(2)	N/A
10. KS	Authorization for turnpike authority Attorney General has opined that design-build may be possible for other agencies as well	KAN. STAT. ANN. §§ 68-2001 <i>et seq.</i> Op. Kan. Att'y Gen. 62 (1978)	N/A
11. LA	Authorization for DOT to implement a pilot program for one design-build project not to exceed \$5 million	LA. REV. STAT. ANN. § 48:250.2	Pursuant to rules adopted by DOT
12. ME	Authorization for DOT	ME. REV. STAT. ANN. tit. 23, § 753-A	Low-bid award or best-value award. Best value award should be submitted to the department in two components – technical and sealed price proposal
13. MD	Authorization for capital projects Has been used for light rail	MD. CODE ANN., STATE FIN. & PROC. § 3-602(g)(1)	N/A
14. MA	Authorization for Department of Highways to enter into Development Agreement for Route 3 North Authorization for Mass Bay Transportation Authority	1999 Mass. Acts 53, 56 2000 Mass. Acts 125	Pre-qualification, request for proposals, possibly oral presentation; award to developer who best meets the selection criteria for the benefit of the Commonwealth; selection of other than lowest-overall-cost is allowed if a written explanation of the reasons is given
15. MN	Authorization for streets, highways, bicycle paths, bicycle trails and pedestrian facilities, light rail transit facilities and DOT projects	MINN. STAT. ANN. § 473.3993 MINN. STAT. ANN. § 160.262 MINN. STAT. ANN. § 161.3410	DOT authorized to procure design-build contracts using either a two-step, best-value selection process or a low-bid process, not to exceed 10 percent of DOT contracts each year; light rail contracts may be awarded on the basis of the RFQ or RFP without bids

State	Transportation Agencies with Authority (1)	Citation for Statutory Design-Build Authority (2)	DOT Procurement Process
16. MO	Authorization for DOT to use alternative procurement process	MONT. CODE ANN. § 60-2-112	Award by means other than competitive bidding is allowed if special circumstances so require and are specified in writing
17. NV	Authorization for public bodies and DOT for projects that exceed \$30,000,000 may also be used for projects over \$5,000,000.00 that meet certain criteria.	NEV. REV. STAT. §§ 338.1711-338.1727 and 408.3875-408.3887 (effective until Sept. 30, 2003)	Request for preliminary proposals followed by issuance of request for final proposals to "finalists"; award based on most cost effective and responsive proposal using criteria and weight assigned to each factor. Preference for local contractors if not federally funded
18. NH	Projects authorized to use design-build by the State capital budget	N.H. REV. STAT. ANN. § 228:4(l)(f)	Selection to be based on objective standard, measurable criteria for evaluation
19. NM	Authorization for Highway Department pilot program	1999 N.M. Laws ch. 97, § 1; N.M. STAT. ANN. §§ 13-1-111 and 13-1-119.1	Two-phase process: shortlisting followed by evaluation of technical cost proposals schedule. Phase Two: proposals evaluated on technical concepts or solutions, costs and scheduling; awarded to highest ranking firm.
20. NC	Authorization for DOT to enter into design-build-warrant contract for "CARAT" traffic management system Authorization for DOT pilot projects Authorization for Turnpike Authority to use alternative procurement process	N.C. GEN. STAT. § 136-28.1(j); 1997 N.C. Sess. Laws 443, § 32.11 H.B. 644, 2001 Gen. Assem., Reg. Sess. (N.C. 2001)	None itemized
21. OH	Authorization for DOT pilot program	OHIO REV. CODE ANN. § 5517.011	Allows value based selection process combining technical qualifications and competitive bidding elements; two phase process, pre-qualification then separate technical and price proposals; scored tech proposal weighed at 25% or less of value based criteria; technical scores used to adjust price, award to finalist with lowest adjusted price
22. OR	Authorization for DOT tollway projects	OR. REV. STAT. § 383.005	Department may award any (tollway) contract under a competitive process or by private negotiation or any combination of competition and negotiation; factors considered are: cost, design quality, structural integrity/maintenance, aesthetics, traffic, safety, small business participation, financial stability & experience

State	Transportation Agencies with Authority (1)	Citation for Statutory Design-Build Authority (2)	DOT Procurement Process
23. PA	Authorization for Department of General Services	62 PA. CONS. STAT. §§ 103 and 322(2)	N/A
24. SD	General authorization for public corporations	S.D. CODIFIED LAWS § 5-18-26	Performance criteria on a project by project basis (assuming the DOT is a “public corporation”)
25. TN	Authorization for state agencies and authorities--specifically excludes DOT contracts	TENN. CODE ANN. §§ 4-15-102 and 12-10-124	N/A
26. TX	Development agreement authorization for Texas Turnpike Authority (a division of TxDOT)	TEX. TRANSP. CODE ANN. § 361.302	None itemized
27. UT	Authorization for transportation agencies including the DOT	UTAH CODE ANN. § 63-56-36.1; UTAH ADMIN. CODE R916-3	2 phase process, pre-qualification then proposals; after considering price and other identified factors, award is to proposal which is most advantageous to the state
28. VA	Authorization for limited number of DOT contracts; general authorization for other state agencies	VA. CODE ANN. §§ 11-41 <i>et seq.</i> and 33.1-12	Award to be based on objective criteria adopted by Commonwealth Transportation Board; objective criteria to include requirements for pre-qualification and competitive bidding
29. WA	Authorization for DOT for projects over \$10m; authorization for other public bodies for projects over \$12m	WASH. REV. CODE §§ 39.10.051 (effective until July 1, 2007) and 47.20.780	DOT to “develop a process for awarding competitively bid highway construction projects.”
30. WI	Authorization for specific bridge projects	WIS. STAT. ANN. §§ 84.11(5n) <i>et seq.</i>	2 phase competitive selection process; pre-qualification then proposals; evaluation criteria must include qualifications, quality, completion time and cost.

APPENDIX 4

Recommended List of States/Agencies To Be Surveyed

Appendix 4

RECOMMENDED LIST OF STATES/AGENCIES TO BE SURVEYED

The following list is based upon preliminary conversations with public officials and designers-builders in each state. (See also Appendix 2, "State Survey of Public Agencies That Have Utilized Design-Build Transportation Projects", which shows the justification for the recommendations.)

PRIMARY LIST:

1. Arizona DOT

The Arizona DOT has legislative authorization to award DB projects. Some of its DB projects include the I-10 emergency bridge replacement, I-17 segment in Phoenix, and the 13.5 mile reconstruction of SR 68 and US 60. Arizona is widely acclaimed as one of the most forward-thinking DOTs in innovative contracting in America today. The new Federal Highway Administrator is Arizona's former Secretary of Transportation, leading to the possibility that Arizona's innovations may become more widespread.

2. Colorado DOT/RTD

The Colorado legislature has given the DOT specific design-build authority. The DOT, acting as the lead agency for a joint procurement with Denver's Regional Transportation District, recently awarded a \$1.186 billion design-build multi-modal contract for the Transportation Expansion Project. The project is federally funded and includes a DBE program that complies with the current USDOT regulations. The contractor was selected using a best value procurement process. The DOT also has developed several other DB projects.

3. Florida DOT

Florida is one of the first agencies to use design-build for bridge and highway projects, and sought and obtained design-build legislation a number of years ago. They have obtained programmatic authorization from FHWA; they have completed numerous design-build projects; and they are one of the leading agencies in the nation using design-build.

4. Ohio DOT

Ohio DOT is one of the agencies that has received programmatic approval from FHWA to proceed with design-build projects, completing 25+ projects. It has historically used a low bid selection methodology, but in 1999 obtained legislation authorizing use of alternative selection methodologies.

5. Utah DOT

Utah is one of the agencies leading the nation in design-build projects, starting with the recently completed \$1.4 billion I-15 Reconstruction project. Last year the DOT awarded contracts for a new highway (the Legacy Parkway) and an interchange project. It has also pursued several smaller projects, including two ITS projects.

6. Orange County (California) Transportation Corridor Agencies (TCA)

The TCAs were among the first agencies in the nation to use DB for highway projects. Their first project, the San Joaquin Hills Toll Road, was completed in 1996. The Eastern Toll Road was completed in 1998. They are currently proceeding with another greenfield toll road and an interchange project, also using DB. They have general legislative authorization to enter into contracts, without any restrictions requiring competitive bidding. We will seek out information regarding procurement, protests, project management, acceptance, and warranties. Also of interest is the evolution of the procurement process over time — the first project was a strict low bid procurement; their second procurement allowed alternative technical concepts; and their third project was awarded based on a best value selection process.

7. Alameda Corridor (California) Transportation Authority (ACTA)

ACTA is proceeding with a DB project based on a “lowest ultimate cost” negotiated procurement authorized by the Los Angeles City Charter. The project is scheduled for completion in April 2002. The Authority has learned a number of lessons regarding matters such as the quality control process and rearrangements of utilities and city facilities which we believe would be valuable for the NYSDOT report.

8. Federal Highway Administration (FHWA)

The Central Federal Lands Highway Division (CFLHD) of FHWA awarded its first design-build contract in 1998. The \$33.4 million contract, the largest ever awarded by CFLHD, was awarded to reconstruct El Portal Road in Yosemite National Park, Calif. It would be productive to interview FHWA to obtain the benefit of lessons learned during this process, particularly since the draft design-build regulations recently issued by FHWA would require state agencies to follow federal procurement rules.

9. South Carolina DOT

SC DOT has proceeded with a DB program based on its general contracting powers and legislation authorizing it to negotiate agreements for financing and developing highways, roads, streets, and bridges. Notable projects include the Conway Bypass, Carolina Bays, SC 170, and three bridge replacements.

10. Naval Facilities Engineering Command (NAVFAC)

The Navy has significantly used design-build for the past 20 years, although they began delivering design-build housing projects 40 years ago. Design-build has become the Navy's preferred method for delivering projects. Due to the Navy's broad capability, and due to the wide array of projects, we believe there is much to be learned both about their procurement procedures and their experiences in developing different types of projects.

Additionally, a number of other owners will be interviewed if time permits. Surveys will be sent to them and any responses received will be included in the final report.

SURVEY ONLY LIST:

1. Michigan DOT

Michigan DOT has proceeded with a design-build program without specific legislation. They have done 21+ projects, including the I-275 reconstruction, four bridge superstructure replacements, a ferry boat, eleven bridge deck replacements, weigh stations, pavement rehab, an interchange and an ATMS project. However, it is our understanding that Michigan DOT does not plan to use DB for future projects. We want to find out why.

2. New Jersey DOT Atlantic City Brigantine Connector (single project)

Last year a private developer completed a \$190 million tunnel project in Atlantic City. The project was funded in part by the developer, in part by a toll authority and in part by the New Jersey DOT. The contract was awarded on a low bid basis because the DOT does not have special legislation authorizing use of alternative procurement process for design-build projects. Since very few tunnel projects have been developed using design-build, we believe it would be valuable to ask the developer regarding lessons learned.

3. Maine DOT Bath-Woolwich Bridge (single project)

The Maine DOT has used its legislative DB authorization for only one DB project to date -- the Sagadahoc Bridge (\$47 million) (aka the Bath Woolwich Bridge), completed in 2000. We believe the report will benefit from a review of the procurement process used as well as lessons learned regarding DB bridge projects and warranties.

4. Minnesota DOT Hiawatha Light Rail (LRT) (single project)

The Minnesota DOT is currently developing a light rail project. The contract was awarded based on project-specific legislation. Both the procurement process used and the contract terms are of interest.

5. Northwest Parkway in Colorado

The Northwest Parkway project is a toll road project being developed using DB. It is our understanding that the price for the project exceeded

the budget, and that the owner negotiated contract modifications to reduce the price, including shortening the warranty period from three years to two years in exchange for a lower contract price. The value/cost of an extended warranty may be of interest to the NYSDOT in creating its own warranty terms for DB projects. We did not put it on our primary list because the project only recently started construction.

6. Greenville County, South Carolina

Greenville County, South Carolina has been delivering most/all of their projects via DB for three or four years. These include roads, interchanges, courthouses, etc. We believe it would be interesting and valuable to interview them; however, we did not put them on our primary list because they are a municipality, not a statewide department of transportation.

7. University Light Rail (LRT)

The Utah Transit Authority (UTA) awarded a DB contract for development of an LRT project in 2000. The project was recently completed ahead of schedule. The procurement process used was critical to the project's success. The project involved numerous stakeholders, and the need for innovation in relocating utilities. Inclusion of public relations in the design-builder's responsibilities has proven invaluable. The contract included an innovative payment concept — price centers. We did not put this project on our primary list because it is a light rail project developed by a local transit agency. We nevertheless believe it would be useful to survey UTA because of its many successes.

APPENDIX 5

Interview and Survey Mailing List for NYSDOT Design-Build Survey

Appendix 5

INTERVIEW AND SURVEY MAILING LIST FOR NYSDOT DESIGN-BUILD SURVEY

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Colorado Department of Transportation
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APPENDIX 6

Cover Letter and Blank Survey Document



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
ALBANY, N.Y. 12232

JOSEPH H. BOARDMAN
COMMISSIONER

GEORGE E. PATAKI
GOVERNOR

December 14, 2001

New York State Department of Transportation is developing management and administrative procedures for the purpose of utilizing Design-Build type of contracts as a tool to assist with the delivery of our capitol construction program. Currently we have no direct experience with this contracting method but see it as a way of possibly expediting the delivery of capitol projects.

To assist us with the development of management and administrative procedures we have retained the consultant firm of Parsons Brinckerhoff Quade and Douglas. One of the tasks we have asked them to complete is a survey of other states and agencies that have had experience with Design-Build for the purpose of obtaining from those experiences insights to this contracting approach. We hope to learn from others lessons that will make our procedures more effective and efficient.

Your organization has been identified as one with significant experience with Design-Build contracting and we request that you participate in this survey. By copy of this letter we are authorizing Parsons Brinckerhoff to act on our behalf in this matter and to contact you with our survey on Design-Build.

We fully appreciate all the assistance that you can provide and will share the results of the survey with all the organizations that participate in assisting us with this work. Thank you in advance for your participation.

Sincerely,

A handwritten signature in blue ink that reads "Paul T. Wells".

PAUL T. WELLS, P.E.
Assistant Commissioner
and Chief Engineer

Appendix 6

BLANK SURVEY

The survey form asked the following questions:

DESIGN BUILD INDUSTRY PRACTICE SURVEY

Agency: _____

Name of individual: _____

Title of individual: _____

Address: _____

Phone: _____

E mail: _____

Date : _____

1. GENERAL INFORMATION

1.1 How is design-build used by your Agency?

1.2 Provide names and phone numbers of other individuals who could be contacted for additional information about the Agency's design-build program.

1.3 Describe the Agency's design-build program. What projects were completed under the Agency's design-build program? What projects are in process? What future projects are anticipated? What were the types and sizes of the projects?

1.4 Why did the Agency initiate its design-build program?

1.5 Was enabling legislation required for the design-build program? If so, what was the process followed to get legislation passed? Please provide a citation for the enabling authorization and regulations as well as a copy of any relevant internal policies and procedures.

1.6 Did you face opposition to design-build from contractors, consultants or others? What were their main concerns with design build? How did you deal with those concerns?

1.7 Has the Agency's design-build program been successful (e.g. has the program met its goals)? What benefits have resulted from use of design-build?

1.8 What are the criteria used to decide whether design-build is appropriate for a particular project?

1.9 If available in an electronic format, please provide a copy of your procurement and contract documents, as well as evaluation procedures. Are there any documents analyzing or reporting on the results of your design-build projects? How can we get a copy?

1.10 Do you plan to proceed with additional design-build projects? If not, why?

2. PROJECT BACKGROUND

- 2.1 Identify your project(s) and design-build team member(s) for each project.
- 2.2 What was the initial contract price for each project? What was the final contract price? Please describe the reasons for any price change.
- 2.3 What were the Agency's goals (e.g. budget, minimize disruption, etc.)?
- 2.4 Did design-build help the Agency meet its goals? How?
- 2.5 Describe the process used to identify risks and minimize the impact of risks.
- 2.6 Do you believe that design-build accelerated the schedule for project delivery? If so, what were the time savings and how was this determination made?
- 2.7 Do you believe that design-build resulted in a higher or lower total project cost than traditional delivery methods? Please provide an explanation.
- 2.8 How was the project funded?
- 2.9 Did funding issues affect the procurement process or contract terms? If so, please explain.
- 2.10 Was the project phased or segmented? If so, please provide a general explanation of how that was addressed in the procurement and contract documents.
- 2.11 Identify stakeholders interested in the project and what steps were taken to ensure that their needs were met.

3. PROCUREMENT PROCESS

- 3.1 Describe the procurement process used. (pre-qualification? shortlisting? industry review? pre-approval of alternative technical concepts? preliminary proposals + discussions + final proposals? BAFO? negotiations?) How much time did each step take?
- 3.2 Was the industry review process (if used) beneficial? Please describe what changes were made to the RFP and contract documents as a result of the industry review.
- 3.3 How many firms were shortlisted? How many proposals were received?
- 3.4 Describe the proposer selection process (e.g. low bid, best value, describe how best value was determined).
- 3.5 If negotiations were part of the process, were they useful? Please explain.
- 3.6 If the process included final proposals or BAFOs, please explain why, and describe differences between the final proposals/BAFO and the initial proposals.
- 3.7 Did the proposers have the ability to deviate from defined technical parameters in their proposals? What process was followed to obtain Agency approval of deviations? Were the proposed deviations beneficial? Please explain.
- 3.8 Were stipends provided to the unsuccessful proposers? Who was eligible to receive them and what were the amounts?
- 3.9 Describe the proposal review process. How much time did the Agency have to review proposals? How many reviewers were involved in the proposal review process?

3.10 Describe how you evaluated the price and technical proposals in making the selection. (relative weights assigned to price and technical proposals, method used to combine price and technical score, use of adjectival scores or formulas, present value, how options were considered, was schedule a factor, fixed price-best proposal)

3.11 Were there any protests? If so, please describe the circumstances and results.

3.12 Was a Record of Decision required for your project? If so, when was the ROD issued relative to the procurement and contracting process? If the ROD was issued after the RFP was issued or contract awarded, how did you go about incorporating the final requirements into the contract?

3.13 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

4. DEVELOPMENT OF PROCUREMENT PACKAGE

4.1 What level of design was completed prior to issuance of the procurement package?

4.2 What were the components of the procurement package and how is it organized (instructions to proposers, proposal forms, signature documents, general provisions, special conditions, technical provisions).

4.3 Did you use prescriptive or performance specifications? How were they developed?

4.4 Was the proposal made part of the contract? Did the characterization of the proposal as contract document (or not a contract document) create any issues? Did the contract contain limitations on the contractor's ability to deviate from identified configuration of the project? (For example, did the contract identify a "basic configuration" that was mandatory.) What restrictions applied?

4.5 Did you require proposers to submit backup for their price? Where were these documents kept? Were they reviewed during the contract? How did you utilize this information?

4.6 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

5. PROJECT MANAGEMENT

5.1 How was the project managed?

5.2 What roles were played by the Agency and its employees during the procurement, design and construction periods? Consultants? In-house/outside lawyers?

5.3 Describe the design review process. At what stages of design were formal submittals required? Did the agency provide a formal design approval?

5.4 Describe the quality assurance/quality control process. Did you have any issues with design quality? Construction quality? How did you resolve them?

5.5 What conditions were required to be met before the start of construction?

5.6 Has a special process been set up for resolving design-build disputes? If so, please describe your standard dispute resolution process and how it was changed. Also identify the reason for the changes.

5.7 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

6. PAYMENT

6.1 Was the contract price fixed or based on unit prices (or both)? Did you use allowances for certain elements? Was there a contingency pool?

6.2 Describe the invoicing and payment process. Were payments based on progress, milestones, schedule of values, unit prices, price centers or some other method?

6.3 When was mobilization paid and how were mobilization amounts determined?

6.4 Did you allow payment for materials not yet incorporated into the work? What were the conditions to payment?

6.5 Did you limit payment for equipment?

6.6 Did you withhold retainage? What percentage? At what point was retainage released?

6.7 Did you have an award fee/incentive program tied to contractor performance (excluding schedule)? Were there disincentives (liquidated damages) for failure to perform (excluding schedule)? Please describe.

6.8 Did the contractor have the right to substitute a letter of credit or securities for retainage? How was this done? Has it presented any problems for the Agency?

6.9 Were there any limits on the total amount payable at any point in time (i.e. was there a maximum payment curve)? How were these limits determined?

6.10 Are subcontractors entitled to mechanics liens or stop notices in your state? Does the Agency have the right to withhold payment if any were filed? What paperwork is required to be submitted with invoices?

6.11 What were the conditions to final payment?

6.12 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

7. SCHEDULE

7.1 Were the completion deadlines fixed in the RFP or by the proposal? If the latter, how was schedule factored into the evaluation process?

7.2 Did the contract provide for early completion incentives/liquidated damages/stipulated damages? How were the amounts determined?

7.3 Please describe the required schedule submittals (including proposal requirements as well as post-award requirements.). What remedies were available to

the owner if an acceptable schedule wasn't submitted on time? Have you ever exercised those remedies and if so were they effective?

7.4 Who owned the float?

7.5 Was a recovery schedule required if the project fell behind schedule? What triggered the requirement? Was this requirement ever enforced?

7.6 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

8. RIGHT OF WAY/UTILITIES

8.1 What percentage of the ROW was in hand as of the date the RFP was issued and as of the proposal due date?

RFP date: _____

Proposal date: _____

8.2 How many parcels needed to be acquired post-award? What role did the contractor play in the acquisitions?

8.3 Did the RFP ask proposers to identify any additional property required? Did any proposers identify such property?

8.4 Please describe steps taken to identify utilities prior to the proposal due date. How was the risk of unidentified/misidentified utilities allocated?

8.5 Did you negotiate master utility agreements prior to contract award? If any such agreements were not finalized prior to the proposal due date, how were they incorporated into the contract?

8.6 What is included in the definition of utilities? What is your approach to relocation of storm drains, street lights, irrigation or other facilities not included in the definition of utilities?"

8.7 Was here anything you particularly liked or would do differently for your next design-build procurement? Please describe.

9. RISK ALLOCATION

9.1 Did you allow time extensions for force majeure events? Were there any exclusions? Please describe the exclusions.

9.2 Did you allow a price increase for force majeure events? What parameters applied? What was the reasoning behind allowing/disallowing a price increase?

9.3 Did any force majeure events occur during the course of the project? If so, what happened?

9.4 How were differing site conditions addressed?

9.5 How were contaminated materials/contaminated groundwater/hazardous substances addressed?

9.6 Were differing site conditions or unforeseen contaminated/hazardous materials encountered during the course of the project? If so, what happened?

9.7 What permits/approvals were obtained by the agency before the proposal due date?

9.8 What permits/approvals were the contractor's responsibility to obtain?

9.9 Was the contractor given responsibility for environmental mitigation measures? Please describe. Were there any non-compliance problems?

9.10 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

10. CHANGE ORDERS

10.1 Describe the process followed for changes directed by the owner.

10.2 Describe the process followed for contractor claims for additional compensation/time extensions.

10.3 Did the agency have the ability to direct performance of work on a time and materials basis? Were the markups for such work pre-set? If so, what were the markups? If not, how were the markups determined?

10.4 Did the contract provide for value engineering? How were savings shared? How were ROW savings addressed? Were any VE proposals accepted?

10.5 Were there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

11. WARRANTIES/MAINTENANCE

11.1 Did the contract include warranties? Describe the scope/term.

11.2 Did the contract provide that the warranty is the exclusive remedy for defects or otherwise limit liability for defects following expiration of the warranty period?

11.3 Was a warranty bond required? If so, how was the amount determined?

11.4 Did the Agency consider requiring the contractor to perform warranty work or correct defects post-warranty? Please describe the situation and how any issues were resolved.

11.5 What were the contractor's maintenance obligations prior to completion? At what point did the obligation to maintain shift to the Agency or third parties?

11.6 Did the scope include post-completion maintenance? If so, how was payment made for such work?

11.7 Was there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

12. SUBCONTRACTORS/DBE/EEO/KEY PERSONNEL

12.1 What percent of the work was subcontracted (excluding any subcontracts with equity participants and their affiliates)?

12.2 Were any changes made to the Agency's standard DBE policy to address the design-build nature of the project? If so and if available electronically, please provide a copy of the design-build policy. Did the contractor achieve the DBE goals?

- 12.3 How were EEO requirements addressed?
- 12.4 Describe your experience with capabilities and turnover of contractor key personnel.
- 12.5 Is there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

13. INSURANCE/BONDS/INDEMNITIES/LIMIT ON LIABILITY

- 13.1 What insurance was provided by the Agency?
- 13.2 What insurance was provided by the contractor?
- 13.3 Did you require 100% bonds? If not, what amount was required and how was that amount justified?
- 13.4 If the contractor was responsible for cleanup of hazardous materials found on site, did the Agency provide a CERCLA indemnity to the contractor? If not, did the contract include any other provisions intended to provide the contractor with assurance that it will not have liability under CERCLA? Please describe.
- 13.5 Did the contract include an overall cap on liability or limitation on consequential damages? Please provide language.
- 13.6 Is there anything you particularly liked or would do differently for your next design-build procurement? Please describe.

APPENDIX 7

**Completed Surveys
(separate attachment)**